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TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. IV. OF VOL. II., 1917.
No. 4900. Vol. CXCIII. LONDON, SATURDAY, JULY 28, 1917. Price 8d.

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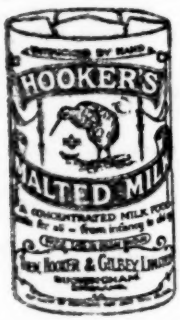

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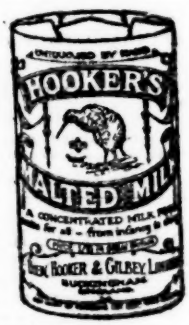

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Davis & Davis—Natural Mineral Waters 38
Salutaris 52
Vichy-Célestins 11

OPTICIANS:—
Watson & Sons, Ltd.—
Microscopes..... 32

SANITARY APPLIANCES, &c.:—
Mechan's Patent Sanitary Destructor 8

STATIONERY, &c.:—
Anderson & Son—
Doctors' A/c Forms, &c. 50
Mabie, Todd & Co.—
Swan Pens 7

TAILORS, BOOTMAKERS, &c.:—
Dowie & Marshall—
Hygienic Bootmakers 32
Evans & Co.—
Service Uniforms, &c. 32
Harry Hall — Service Dress R.A.M.C. and Navy 50

VACCINE LYMPH —
Chaumier's Calf Lymph 39
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Humphrey Taylor & Co.—
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MISCELLANEOUS:—
Gilyard, Bradford—Bowls 50
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M.O. requires Exchange 49
No. 438, L.O., Strand — Capt. R.A.M.C. desires Exchange 49

An Address ON FATIGUE AND ALCOHOL.

Delivered before the Society for the Study of Inebriety, London, on July 10th, 1917,

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MR. PRESIDENT, LADIES, AND GENTLEMEN,—It is unnecessary for me to speak to-day of the general aspects of alcoholism, since I am addressing an audience fully alive to its importance. Indeed, when your secretary's invitation to read this paper reached me I felt much hesitation in accepting it, since it appeared presumptuous for me to speak to those who in many respects are experts. But on consideration it seemed that those who are making a study of the effects of alcohol are justified in expecting to receive help from all possible sources, and therefore I consented to contribute my mite. It must be understood, however, that my investigations on fatigue were commenced as a scientific study, that the scope was enlarged only when their economic and national importance in connexion with the war was recognised, and that no special attention was directed at first to the rôle of alcohol. In all recent work, however, information with regard to the habits of the worker in respect of the taking of alcohol has been obtained, and therefore it is not impossible that facts of interest may emerge.

NATURE AND CAUSATION OF INDUSTRIAL FATIGUE.

With the precise character of industrial fatigue we are not greatly concerned. After eight years' experience I am still without a satisfactory definition, but it may be taken as a deficiency of vigour—of the power of doing work—of a feeling of wellbeing. Different states are referred to under the same name. It will be sufficient if we remember that on the present occasion it is to be regarded partly as a diminished capacity for doing work, partly as a feeling of unfitness and of being below par.

With its causation we are more directly concerned, since there can be little doubt that whatever circumstances favour the development of fatigue tend also to favour intemperance. Fatigue has been associated so long with the performance of labour that it is often regarded as being necessarily and wholly due to it, but a little study of the subject will show that, however true this may be of fatigue in the strict physiological sense, it cannot be upheld either in regard to the fatigue of the industrial worker or in regard to the condition of debility, often described as fatigue, which is found in the invalid. In short, many factors besides labour enter into the causation of fatigue, and of these the most important are connected with environment. In this country we are just beginning to perceive that true efficiency is only possible under the best conditions in the factory. Very few have realised that the conditions of the worker's home are important also. Yet simple logic might show that the human machine, infinitely more complex and highly tuned than any work of man, is correspondingly delicate and dependent for its efficiency upon suitable surroundings. In America this is fully recognised, and vast sums are expended every year in order to ensure to the worker satisfactory home and factory conditions, as well as to give him those opportunities for leisure, relaxation, and healthy amusement which he has always lacked, but without which he can never attain true efficiency. It may be said in passing that such a policy, though undoubtedly commending itself to present-day employers on account of its humanity, is yet immensely strengthened in its position owing to the fact that it pays.

A parallel may be drawn between the multiple origin of industrial fatigue on the one hand, and of the simpler condition of physiological fatigue as studied in the laboratory on the other. The latter is usually attributed partly to a using up of energy-producing substances, partly to a clogging of the mechanism with waste products. We have only to extend our conception of waste products slightly to include substances of similar action produced in the body by perversion of normal processes. Thus circumstances which interfere with the healthy activity of the organism may give rise to a toxin-produced fatigue. The late Sir Lauder Brunton in one of his charming articles refers to the man who gets up tired, goes to bed tired, and is tired all the time, as a result of poisons produced not by the action of his muscles but by perverted action of his intestine.

RELATION OF FATIGUE AND THE TAKING OF ALCOHOL.

From this very brief reference to the nature and causation of industrial fatigue I must pass to some consideration of the main subject of this paper—viz., the influence of fatigue upon the taking of alcohol. That such an influence exists may not have suggested itself to everyone, but the result of my experience of industrial fatigue has been to convince me that fatigue lies at the very root of chronic alcoholism. The importance of such a connexion, if it exists, is great—how great I shall endeavour to show. We must consider the nature of the connexion, and the first question is, Why do men drink?

Historically it is found that in all stages of our civilisation, and in all parts of the world, people have resorted to the preparation and consumption of stimulants, and a suggestion has been made that this fact indicates a legitimate demand and use for those stimulants. It is not on account of their food value that they are popular. Indeed, many of the stimulants used have no food value, however that vexed question may be settled with regard to alcohol, but many of them are palatable drinks; they give a feeling of warmth and (are supposed to) ward off chills; they modify the pangs of hunger; they produce a sense of enjoyment, gratification, and comfort; they give greater zest to social intercourse; they lessen pain, relax nerves wearied by physical or mental labour, relieve the pressure of daily cares, deaden trouble and anxiety, improve the outlook on life, impart fresh vigour to the healthy man, and enable him to surmount difficulties and perform deeds which otherwise he would have regarded as beyond his powers.[1]

Here, perhaps, we have an indication of why many men drink—viz., the existence of a craving for some artificial stimulant capable of producing effects that could not be secured naturally. It varies in form and intensity in different individuals, and it must not be assumed because a man does not take alcoholic drinks that therefore he takes no stimulant. Opium, cocaine, quinine, are extreme alternatives. Tea, coffee, and tobacco also are taken as stimulants, whilst some of the patent medicines which are taken freely by abstainers are comparatively rich in alcohol.

The human race long since decided that the most convenient and acceptable form which the stimulant can take is alcohol; hence the widespread use of the drug. As will be seen, most of the reasons given for the consumption of alcohol are largely independent of fatigue; they account principally for the drinking of spirit as an aid to enjoyment and to the zest of social intercourse. They are concerned principally with what is well described as convivial drinking—a form of alcoholism which, however greatly to be deplored, is nevertheless far less harmful to the individual and to the race than is the persistent taking of smaller quantities. This latter form of drinking, in which small quantities of alcohol are taken at intervals throughout the day, and which, since it is found principally amongst industrial workers, is often known as industrial drinking, is allied to the drinking that goes with disease, with emotional depression and worry, with bad and insufficient food. Its origin is not to be found in any simple inborn trait, it is not the result of an inebriate diathesis. On the contrary, it is to be sought in the reaction of the organism to the ordinary physiological effects of alcohol. Industrial drinking is caused by conditions which "induce in the organism certain states which are favourably modified by alcohol."

EFFECT OF ALCOHOL.

What, then, is the effect of alcohol upon the organism? According to a summary given by Sullivan,[2] the most constant effect of moderate doses is a stimulation of psycho-motor function, so that voluntary movements are easier and quicker (Kraepelin, Rudin). Simple reaction-time is shortened, the greater rapidity of its motor part overbalancing the prolongation of its sensory period. The psycho-motor excitation lasts only a short time and is succeeded by depression.

[1] Pratt: The Licensed Trade.
[2] Sullivan: Alcoholism.

Kraepelin, with doses of 50 gm. absolute alcohol, found stimulation last half an hour. With larger doses the duration of the phase is shorter, the paralytic effect of the drug showing itself earlier. In some instances small doses seem capable of causing stimulation with no appreciable subsequent depression. The motor stimulation is directly perceived by the individual, and is felt as a sense of increased energy. This feeling is the origin of the common belief in the strengthening action of alcohol, and is thus one of the chief causes of the general use of alcoholic liquors.

On sensory function the action of alcohol is depressant, shown in simple tactile, visual, and auditory impressions, and is apparent in the case of muscular sensations in the diminished accuracy of fine motor adjustments. In intellectual processes alcohol decreases speed and accuracy when tested by adding figures, committing numbers to memory, &c. The depression of sensory and intellectual function seems to last a considerable time—probably as long as 24 hours in some individuals. In more resistant subjects it is much briefer. There may be a summation with daily doses, which will be perceptible some days after the drug has been discontinued. The subjects are not conscious of the impairment of sensation and reasoning, but believe that their mental keenness is increased. Owing to the dulling of sensation disagreeable impressions are less felt, and this fact contributes, with the stimulation of motor and secretory activity, to give rise to that feeling of well-being which is the most signal constant effect of alcohol. Dr. Rivers[3] says:—

"When we consider subjective signs of fatigue—the sensations which supervene during the performance of work, and objective fatigue—the lowered capacity for work shown by a diminution in the amount of work performed, it is evident that these conditions do not always run parallel courses. Decided sensations of fatigue may be experienced when the objective record shows that increasing amounts of work are being done, and sensations of fatigue may be completely absent when the objective record shows that the work is falling off in quantity, or in quality, or in both."

The distinction is important as bearing on the suggestion that alcohol may sometimes produce effects which appear to be beneficial in consequence, not of any direct action on the capacity for work, but of their influence on the sense of fatigue, diminishing those unpleasant sensations which act as our valued warnings that we are approaching the limits of most favourable activity of our organs. A drug acting in this way would exert no beneficial action in fatigue, but would act as an accelerator of exhaustion.

Work on these lines has been carried out in the laboratory far removed from conditions of actual labour and upon a number of subjects so limited that personal idiosyncrasies could not be excluded. On the other hand, we have observations carried out in actual factories and workshops upon large numbers of individuals and by methods somewhat less refined. By a comparison of the results of the two methods we arrive at the conclusion that one of the chief effects of alcohol is to abolish the unpleasant symptoms created by labour.

CAUSE OF PRODUCTION OF UNPLEASANT SYMPTOMS BY LABOUR.

It has already been shown that "industrial drinking"—by far the most pernicious form of alcoholism—is caused by "conditions which induce in the organism certain states which are favourably modified by alcohol." Amongst these states are those which show the "unpleasant symptoms produced by labour." We must therefore ask, "Why are unpleasant symptoms produced by labour"? The result of an ordinary hard day's work in the open air is a pleasant lassitude rather than a feeling of discomfort. What is the difference?

The answer to this question is at once an impeachment of our methods and an explanation of the widespread prevalence of industrial drinking. For it is not healthy labour which produces unpleasant symptoms: it is labour performed under factory conditions—for too long hours by workers already tired and often underfed, whose health is undermined by unhygienic surroundings, whose aspirations and ambitions have been killed, and who often have become mere machines. The worker is not, as a rule, communicative, except to his fellows. He has little to say to his superiors, and regards the inspector with amused tolerance. As a result, employers know little of the inner life of the worker, and often enough are ignorant of the conditions under which he lives. Only those who have spent long periods in close association with him and have studied his home life as well as his daily round in the factory have any idea of what his existence really is. Hence, as a rule, his attitude is entirely misunderstood. It is easy for those who are living, it may be, strenuous lives themselves, but who at all events enjoy comparative comfort at home, to decide that the patriotic worker can well afford to give up his Bank Holiday in order to increase output. They will probably be surprised to hear of cases where the daily round of the worker commences at 4 o'clock in the morning and ends at 10 o'clock at night, and where the poor six hours left for "home life" are passed in surroundings so squalid as to make a stable, with clean straw, preferable. They do not realise the feeling of utter helplessness which industrial fatigue in its severer phases really means. No one who has not experienced it can understand it; neither can they understand the gallantry of those who struggle against it day after day, week after week, with nothing to look forward to but an occasional "Bank Holiday," and with a great probability that even that may be cancelled.

"The first experience in exhaustion, in failing nerve and hopelessness is terrifying to one who has had health and strength. He grasps at anything that will give him back even for an hour his sense of well-being and confidence. Collapsed energy is as real an ill as a broken leg, and more to be feared because less understood. Industry is trying to understand why it comes so early to so many. It is because of long hours, poor air, bad water, and cold lunches taken under conditions that would make even good food indigestible. The men are so done up that they take liquor as a means of quick—if brief—recuperation."

This view, expressed by a writer in the United States,[4] is sound and can be proved by many instances. In factories where these evils have been corrected the results are remarkable. With the introduction of a lunch-room and recreation grounds in one factory, two out of three public-houses in the immediate neighbourhood were obliged to close. Soon the third disappeared also.

EFFECT OF IMPROVED CONDITIONS.

Good food has a great influence. With good food a man can work easily and continuously. But hard work demands not only that the food shall be good, but that it shall be taken with sufficient frequency also. Almost universally the output of the early morning period has been found to be unsatisfactory, owing often to the unfed state of the workers. Last week a new instance occurred. In the factory concerned the dinner hour is from 12 to 1. Dinner as a rule is finished by 12.30, and no further meal-time is arranged till 5.30, when a quarter of an hour is given for tea. The men explained that the period is too long, and that about 3 or 4 o'clock they feel weak and "sinking." In consequence many of them take small quantities of food into the works, though it is not allowed. They might well take alcohol also.

From America comes a report of the Lake Carriers' Association. The men on the great lakes have worked under as bad conditions as could be conceived, with the result that usually the chief thing they provided for a trip was a jug of whisky. Six years ago the association set heartily to work to improve things. They have provided the best sanitation and ventilation; food and water are carefully supervised. Quarters are comfortable. Assembly rooms are provided at the various ports. Since this campaign of improvement began accidents due to intoxication have been automatically cut down 75 per cent.

It is on conditions that the first attack must be made, but since working men have the habit as a class something more will be necessary. Persuasion, "cures," even ridicule, have been found efficient helps. The work done at the Ford plant, where 20,000 men are employed, is magnificent.

Thus, then, is our question answered. Men drink because of the fatigue produced by labour; not, be it understood, that industrial labour necessarily produces a fatigue which leads to alcoholism. Where conditions have been made perfect, not only is drinking rare, but—a much more surprising fact—the tradition has been broken. It is not with industry that we have a quarrel, but with the conditions under which it is carried on.

[3] Rivers: Influence of Alcohol, &c., on Fatigue.

[4] Tarbell: New Ideals in Business.

It may perhaps be thought that I have devoted too much time to this side of the subject. My excuse must be that the influence of fatigue upon alcoholism is out of all proportion more important than the influence of alcohol on fatigue. The questions are necessarily connected and should be studied together, but the *immediate* effects of the taking of alcohol on output appear to be trivial, even in these days of industrial stress, when the question of industrial drinking and the harm it does is brought under consideration.

CONDITIONS EXISTING IN DIFFERENT OCCUPATIONS.

Since the graver social results of excess in this country are connected with chronic intoxication and not with simple drunkenness, and since the main source of this chronic intoxication is to be sought in the use of alcohol as an industrial stimulant and as an antidote to fatigue, it is evident that a study of the conditions which exist in different occupations and which encourage this form of drinking will be of interest. Much of what follows is given in Dr. Sullivan's[5] own words: The forces which determine the alcoholism of a given industrial group vary according to the circumstances of time and place, and the drinking habits which are their resultant vary also. But in each form of industry may be recognised certain general tendencies which give to its alcoholic tradition a more or less characteristic stamp.

Waterside labour.—This includes distinct varieties of employment, but the variations are slight. There is a general sameness in the nature of the effort—in the demand for sudden spurts of energy rather than for skill. The social status of the group is low. The proportion of those living in London, where three or more individuals inhabit one room, amounts to about 28 per cent. The ordinary rank and file of dockers earn at their trade from 8*s.* to 21*s.* per week. Work starts between 6 and 7 A.M. Besides the regular meal-times there used to be, and indeed still is, a general practice of recognising "bever times," pauses for refreshment, one in the forenoon and one in the afternoon, each lasting about 15 minutes. The common habits of the industrial drinker in dock labour are largely fixed by these intervals, together with the regular meal-times. The day's routine will be somewhat as follows:—

Before work in morning, half-quartern rum in coffee, or half glass ale with gin, or a glass of four-ale. At breakfast, a pint or more of ale, with hardly any solid food. First "bever" time, ½ to 1½ pints. Dinner, 1 to 2 pints. Second "bever" time, ½ to 1½ pints. After work, 1 to 2 pints. Total for the day, 6 pints or more.

From the average wage earned it is evident that the food of the docker must always be deficient. When money is spent on liquor there is necessarily a further lowering of his food allowance. This condition of under-feeding contributes to the more rapid development of the lesions of chronic alcoholism. Industrial drinkers at this work often suffer from gastric catarrh and severe nervous disorders before they are 40. The docker's ordinary drink is "four-ale" (mild ale = four-ale, is a "sweet, rather strong beer," Wynter Blyth). A very few use rum as a regular industrial stimulant. A small proportion are teetotallers. Two examples may be given:—

1. T.M., unmarried, aged 48 years. Gastric catarrh and nervous symptoms. Several attacks of D.T. Fairly steady work. Three solid meals, 6*d.* each; dose, 6*d.* Balance of 2*s.* 6*d.* practically all on liquor, partly industrial drinking, partly in convivial carouse after work.

2. G.M., stevedore, aged 32 years, married, two children. Gastric catarrh, with vomiting of blood. Dream consciousness after alcohol, and subject to hallucinations. Regular work and overtime, 6*s.* 6*d.* a day; 4*s.* 6*d.* given to wife, on which she keeps herself and the children, and refunds him his dinner money next morning. Remaining 2*s.* goes mainly in industrial drinking. Takes no breakfast, but works on beer till dinner-time, when he takes a solid meal.

The Thames-street fruit-porters are paid for their labour in brass tickets, which can be changed for money later on by the clerk, or which can be cashed at any time by a public-house which has the special privilege of cashing them, the porter taking a proportion of their value in drink. The second alternative is nearly always adopted, and a great number of these men do their work almost exclusively on beer. These conditions produce the maximum development of industrial alcoholism. Coal-wharfers have drinking traditions which are even more vigorous. They recognise a third regular pause for "going to mug," midway between the starting of work and the breakfast-hour. It is to the conditions existing in these forms of unskilled labour that the excessive alcoholism characteristic of seaport towns is due.

Other forms of unskilled transport labour work under very similar conditions. Characteristics are the need for sudden spurts of hard muscular effort; freedom from control as to drinking by their employers. Industrial drinking is very prevalent amongst them. Cabmen, and tram and 'bus drivers have a similar disposition to steady industrial drinking, which is reflected in their high death-rate from alcoholic disease.

Building trades.—This is a complex group, including mechanics, labourers, &c., working for large or small masters. Mechanics, such as bricklayers, carpenters, &c., earn about 32*s.* per week in London; labourers about 23*s.* 3*d.* Three persons to a room or more were found in 15 per cent. of the class as a whole—up to 24 per cent. among bricklayers. Industrial drinking is very prevalent, and similar in type to that in vogue amongst the dock labourers. Wages are paid weekly, but in small firms a "sub" for beer can generally be had when desired, or the foreman will guarantee the workman's credit at the public-house. But in this there is a great difference in different firms. The small man, whose work is not such as to suffer much from unsteadiness of hand, is not accustomed to make difficulties about frequent sending out for beer. He does not provide a mess-room and boy for cooking, and therefore the men are apt to scamp their regular meals. The big employer, dealing perhaps with dangerous work, often restrains the drinking habits of his workmen.

Carriage building is somewhat similar to the building trade, the difference between large and small employers being especially well marked.

Gas-stoking.—As a rule, one set of retorts is drawn and recharged every hour, and as this can be done in half an hour the remainder of the time is free for rest and refreshment. Such conditions allow of much industrial drinking, and alcoholism is extremely prevalent.

Glass blowing.—The muscular effort and the heated atmosphere tend to industrial alcoholism. The industry ranks high in the scale of alcoholic mortality.

Metal trades, a very heterogeneous group, but in general the muscular effort and heated atmosphere encourage industrial drinking. It is interesting in view of present-day articles on the workman's beer to note that in early days beer was referred to as a seemingly indispensable part of the diet of the workman of this class.

With complexity of machinery, and increasing stringency of factory legislation, leading to increased interest by the employer in the safety of his workman, efforts to check this disposition to alcoholism were made. But there was, and, indeed, still is, a strong tradition towards industrial drinking in many works. Much liquor seems to be smuggled into factories, even where it is strictly forbidden. Where more skilled work is concerned the workers recognise the position, and industrial drinking is quite exceptional.

Textile industries.—In the textile factories facilities are limited, the bringing in of liquor is forbidden, and no interruption in the working day is recognised except for breakfast and dinner. The relative freedom from alcoholism is of comparatively recent acquisition, and in great measure is due to the alterations in hours and circumstances of labour which have been brought about by the Factory Acts. At one time the labour in the textile industry was, by reason of its excessive duration and the foul and dust laden air in which it was carried on, one of the most arduous and exhausting in the whole field of manual labour, and it produced a wide and vigorous development of industrial alcoholism. The effects which factory legislation has wrought are a striking illustration of the extent to which intemperance can be modified by improvements in the industrial conditions of the workers.

The large amount of female labour in the textile industries has a beneficial influence on the general tendency to drinking habits, for common opinion is less lenient to intemperance amongst women and at the same time more disposed to consider their comfort, and employers have been more ready in textile factories than elsewhere to provide decent refreshment rooms on their premises.

Boot- and shoe-makers.—Much improvement has taken place since in 1895 the trades unions limited the out-work system, till then very prevalent in the trade.

[5] Sullivan: Alcoholism.

Printing.—A very vigorous and deeply rooted drinking tradition seems to have been characteristic of this industry from an early period of its history. Franklin, writing nearly two centuries ago of the printing-house in which he worked whilst in London, says:—

"The beer-boy had sufficient employment during the whole day in serving this house alone. My fellow press-man drank every day a pint of beer before breakfast, a pint with bread and cheese for breakfast, one between breakfast and dinner, one at dinner, one again about six o'clock in the afternoon, and another after he had finished his day's work. ..... He had need, he said, of all this beer in order to acquire strength to work."

This description is substantially as applicable to the London printer of to-day as it was to his predecessor in the early years of the eighteenth century. Even amongst women drinking during the hours of labour is very general. Girls, for instance, who work at book-folding take their lunch and tea beer after the same fashion as the men, and are similarly prone to suffer from alcoholism. Some of the more highly skilled crafts connected with the industry compel a departure from the tradition of free drinking. Lithographic printing requires extreme accuracy, and a muddled workman may cause his employer to lose heavily over material and labour.

Coal-mining.—The conditions in this industry which determine the drinking habits of the workers are uniform and distinctive. The large scale of the operations prevents the contrast between large and small employers frequently met with in other trades. The extreme danger of drunkenness in the pit affects many interests and leads to a correspondingly rigorous supervision of the sobriety of the individual. Amongst miners, accordingly, industrial drinking is practically unknown, though they are remarkably prone to convivial excess.

EMPLOYMENT OF WOMEN.

Besides the textile trades and printing many industries employ women. Their alcoholic proclivity is very much as we find it in men; it is less when the work is carried on in large factories than when it is done in small shops; less with time-work than with piece-work; less when the labour is delicate and skilled than when of the coarse muscular kind. In the less organised forms of industry the casual woman worker often belongs to the prostitute class, which is extremely prone to alcoholism.

But the industrial employment of women reacts also indirectly upon home life. It involves a disorganisation of their domestic duties if they are married, and it also interferes with the acquisition of housewifely knowledge during girlhood. The result is that appalling ignorance of everything connected with cookery, with cleanliness, with the management of children, which makes the average wife and mother of the lower classes one of the most helpless and thriftless of beings, and which impels the workman, whose comfort depends on her, to spend his free time in the public-house and to look upon alcohol as a necessary condiment with his tasteless and indigestible diet. Both directly and indirectly the employments which withdraw women from domestic pursuits are likely to increase alcoholism, and, it may be added, to increase its greatest potency for evil—viz., its influence on the health of the stock.

Quite recently it was reported by a committee which investigated drinking among women in Birmingham that their employment in the same industrial work as men had led to the gradual adoption by women of some habits hitherto particular to men. Opinion among younger people of both sexes no longer condemns a young woman for taking a glass of beer in a public-house with or without her men friends. The committee think that this tendency to greater freedom of manners is likely to continue.

INFLUENCE OF PROLONGED ACTION OF ALCOHOL ON GENERAL FATIGUE.

The influence of the prolonged action of alcohol upon general fatigue has been tested in observations which have been made on large masses of men in military campaigns and in industrial operations. There is not time to refer to the former of these in detail, but the following instances may be given. Dr. Parkes, of Netley, quoted by the late Sir Victor Horsley,[6] says:—

"A number of soldiers of the same age and type, under similar conditions, were divided into two groups—an alcoholic gang and a non-alcoholic gang. Certain work was given them to do. One gang had beer at their disposal, and when tired resorted to its use. For the first hour or two the alcoholic gang went ahead, but soon their energy flagged, and by the end of the day the non-alcoholic gang had accomplished far more work and had received more pay. After some days the gangs were transposed. Again the alcoholic gang went ahead at starting, but failed utterly towards the end of the day, the non-alcoholic gang accomplishing far more work than the other."

In hard manual labour we have the example of two sets of men, one on the "abstinent," the other on the "moderate" system, who worked for a whole year at brickmaking, which is one of the most laborious of all out-door employments.

Out of 23,000,000 bricks made the average per man made by the beer-drinkers in the season was 760,269; that of the teetotallers was 795,400, which is 35,131 in favour of the latter. The highest number made by a beer-drinker was 880,000; the highest number made by a teetotaller was 890,000, leaving 10,000 in favour of the teetotaller. The lowest number made by a beer-drinker was 659,000; the lowest number made by a teetotaller was 748,000 leaving 87,000 in favour of the teetotaller. The teetotallers were frequently hindered by the drinking of some of the gang.

With regard to military operations, it is stated that the wonderful endurance of the Boer Army has been in great part due to their total abstinence from alcoholic drinks. Sir Frederick Treves says:—

"Troops cannot march on alcohol. When the relief column moved on to Ladysmith it was an extremely trying time by reason of the hot weather. In that enormous column of 30,000 men the first who dropped out were not the tall men, nor the short men, nor the big men, nor the little men—they were the drinkers, and they dropped out as clearly as if they had been labelled with a big letter on their backs."

Forbes Mitchell has repeatedly testified that what men need on exhausting marches, and before and after battle, is "grub," not "grog."

Industrial workers.—The following results are taken from a recent investigation of industrial fatigue. The first group consists of colliers and T N.T. process men. Both of these occupations preclude continual drinking whilst at work. The effects must therefore be due to the taking of alcohol when off duty, at meals, or before and after work. The curves show that the reaction time of the abstainers is uniformly shorter than that of those who took alcohol. The variations also are on a smaller scale, indicating that the effect of a day's work is less. Indeed, the average effect of a day's work in the "alcoholics" is five times as great as in the abstainers.

A similar result was obtained with other tests. The average blood pressure of the alcoholics was lower than that of the abstainers of the same age. Moreover, instead of the rise of pressure which usually accompanies labour, the alcoholics showed a small but distinct fall of pressure in the evening. An analysis of blood-pressure tracings from 77 workers showed that the average systolic pressure in abstainers was higher than in alcoholics, the correction for age having been introduced in both cases. An estimate of the output of different groups of men, and of wages earned, showed that the output and the wages of the two groups, one of which took alcohol, whilst the other did not, were identical. A special way in which drinking, or fatigue produced by it, may influence output is through actual absence from the factory.

R. D., fitter in engineering works. Good workman, had even been abroad, Buenos Ayres, erecting machines for his company.
150413. Arrived at factory 8.30 instead of 6 A.M. Intoxicated previous night.
P. G., ordnance cordite worker. Irishman, very hard worker. Fond of his glass.
160801. Arrived 9.30 instead of 6.30 A.M. "Had too much beer last night."
160806. Arrived 8.30 instead of 6.30 A.M. "Drinking last night."
160808. Arrived 9.30 instead of 6.30 A.M. "Holiday last night."
160829. Did not arrive at all. Race meeting previous afternoon. (This man always seemed to enjoy his work and was upset when there was nothing to do—e.g., owing to shortage of cordite paste. He was not a "slacker," but evidently hated losing time.)

Women.—It is not necessary to refer in detail to the results obtained from the women workers. It may be said that amongst cotton-winders the average effect of a day's work in producing fatigue is twice as great amongst the alcoholics as amongst the abstainers. Amongst the linkers and seamers the same is true. When tables were compiled containing values obtained from 29 abstainers and a similar number of non-abstainers, the average age of the former

[6] Horsley: Alcohol and the Human Body.

being 24 and of the latter 30 years, it was found that the reaction times of the two groups were as nearly as possible equal. With regard to output the data available apply only to cotton-winders. The net result shows that the average rate of work of the abstainers was 260 bobbins per hour, whilst that of the alcoholics was 275. With regard to loss of time no definite information was obtained. There were numerous instances of time lost by the women, especially in the early morning, but no cause was given. Absences occur as frequently amongst the abstainers as amongst those taking alcohol. It should be remembered that no alcohol was taken by these workers during the hours of labour.

Of individual cases I shall say very little. Evidently it would be possible to select cases of efficient workers on either side. In one instance attention was directed to the great efficiency of a particular worker in a cotton-winding room, whose output was compared with that of three other first-class winders. The test was carried on for 25 working days. During a part of this time the particular worker A was employed for 8 hours a day, the other three for 12 hours a day. During the remainder of the time the worker A was employed for 8 hours a day and the other three for 10 hours a day. In spite of this disadvantage in three weeks out of the four A showed a better output than any of the other workers. In one week she was bottom of the list, but she was absent from work for a total of two whole days in that week. Thus, working 8 hours against others working 12 hours or 10, worker A showed an output for the whole period better than the average of the others by about 7·5 per cent. It is to be remarked that she alone of those tested took alcohol, in the form of stout, at dinner and supper.

Another case is that of a man employed in heavy work in an engineering factory. He was pointed out as one who "regarded beer as a food," and took large amounts of it in place of ordinary diet. He was reported to take it for breakfast, with but little else, for dinner, and in the afternoon, and though it is likely enough that he took less than is usual in some industries, yet he took more than his associates, and was regarded as one who drank large quantities. This man had been with the firm for many years and was regarded as one of their best workmen. An inquiry as to his capacity was received by the managing director "with amusement."

Vapour.—A novel form of intoxication is that in which alcohol enters the system directly as a result of the conditions under which work is performed. Alcohol, as well as ether, acetone, and benzene, is used as a solvent in industry. Just now it is largely used in the manufacture of cordite; it is also present in the "dope" used for dressing aeroplane wings. The alcohol constantly evaporates and escapes into the air, and workmen in the neighbourhood as constantly inhale the vapour.

Since the chief mischief wrought by alcohol is brought about through the continual imbibition of small quantities, it is evident that conditions in the operations under consideration are such as to lead to the maximum evil effect. With regard to time things are even worse than in actual industrial drinking; there are not even the intervals between drinks, but the poison is introduced continuously throughout the working period. Precautions are taken by arranging that no person shall work for more than a certain number of successive days in the alcohol-laden atmosphere, and medical inspection is provided so that individuals who prove to be especially susceptible shall be removed and put on other jobs. But our experience of industrial drinking leads to the conclusion that daily periods separated merely by a night's interval are amply sufficient to produce serious mischief, and it is not likely that this mischief can be altogether prevented by separating the periods of poisoning by somewhat longer intervals. Moreover, in some factories, although the women work only alternate days in the vapour, circumstances make it necessary for the men to work periods of three days in the vapour and three days out alternately. The work is unpopular, and men and women try to avoid it.

Accurate knowledge is lacking as to the effect of these conditions on the fatigue and output of the worker, and also on his health and general well-being. Experiments have been made, and are now in progress, and results will soon be available. It may be said already as a result of direct experiment that the special conditions affect different workers in different degrees according to age, younger individuals being more susceptible than those who are older. Moreover, a resistance to the injurious conditions appears to be established after a time, newcomers suffering more than those who have become habituated to the work. Alcohol is not the only volatile substance used. Acetone, benzene, and amyl acetate are present also, the rise of blood pressure observed, as well as the giddiness and disturbance of gait being due perhaps to some of these. The workers complain of a feeling of sleepiness and dryness of the eyes. The sleepiness may be experienced outside the factory, and in the exceptional case of a man who has worked in the vapour every day for two and a half years, instead of three days in and three days out as usual, it is so pronounced that he has become entirely dependent upon being called in the morning, and never awakes naturally in time to get to the factory, as he was accustomed to do previously. A friend of this man, who has known him for many years, stated that he had lost weight—at least a stone—in the last six months, and certainly did not look as well as usual.

The workers also complain of sickness; but instead of this occurring in the morning it comes on in the afternoon, in women about 2 P.M.—in men about 3. I have not been able to find cases of actual vomiting. Small ulcers appear on the eyelids and inflammation spreads to some distance around them. There is a distinct difference in the blood pressure of individual men on days spent in the shop where vapour is present and on those spent in other parts of the factory.

It is not possible at present to say anything definite with with regard to the influence which alcohol has had upon the output of these men. So far as mere impression goes, it appears to produce a disability, or fatigue, which must react adversely upon general output. It probably tends also towards the encouragement of further drinking.

Information reached me lately of the prevalence of drunkenness among the workmen of a large cordite factory in the North. The suggestion was made that it might be due to inhalation of vapour. I have not yet had an opportunity of investigating the matter on the spot, but further evidence seems to show that the intoxication was produced in a far more commonplace manner.

CONCLUSION.

It appears, then, that the taking of alcohol has little immediate effect upon the physical side of fatigue, whatever its ultimate result may be. The amount of output may perhaps be increased to a small extent for a time, but the increase soon falls off and is replaced by a diminution. The influence of alcohol upon the psychical side of fatigue is more profound. It leads immediately to a feeling of renewed vigour and increased strength. But here also the effect is transitory, and repeated doses must be taken if anything lasting is required.

If we look at the other side of the question and ask, What is the influence of fatigue upon the taking of alcohol? the answer is clear. Fatigue, as we understand it, involves physical discomfort. The worker knows full well that this discomfort can be diminished by drink. What more natural than that he should turn to it? Because the effect is transitory the dose will be repeated again and again, and industrial alcoholism will be established.

Ordinary drunkenness is diminishing amongst us, and we can afford to ignore its occasional appearance if we can destroy the infinitely more harmful industrial drinking. The problem should be placed upon a new basis. It should no longer be regarded merely as an industrial evil to be deplored or to be treated by an appeal to its victims; it is a scientific problem to be solved by an appeal to the laws of cause and effect. Too long has it been treated with reference to symptoms only. Let it be treated on scientific lines, let the *cause* of intemperance be attacked, and let the attention which the great war has drawn to the lot of the worker bring to him the greatest possible blessing.

The data are sufficient for a solution to be reached. Alcoholism follows industry, but its severity is dependent on the conditions of industry. Conditions determine fatigue; fatigue induces men to drink. Clearly, therefore, our attack must be on conditions. Where conditions have been improved fatigue and drinking have diminished.

The true cure for alcoholism is the provision of decent surroundings in the factory and in the home, adequate wages, leisure and relaxation, clubs, recreation rooms, indoor and outdoor games—in short, the elements of a healthy, full, and interesting life in place of a mere existence without interest, without pleasure, and without hope.

ON THE FALLACIES OF RELYING SOLELY ON

AGGLUTINATION TESTS FOR DIAGNOSIS OF TYPHOID FEVER IN ANTITYPHOID INOCULATED INDIVIDUALS.

WITH SPECIAL REFERENCE TO THE USE OF DREYER'S METHOD.

BY R. P. GARROW, M.D. ABERD., D.P.H.,
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THE diagnosis of the enteric group of diseases is a subject of great importance in military medicine, not only from the point of view of treatment and general hygienic efficiency, but also in view of the necessity for reliable statistics on which to base an estimate of the efficiency of anti-enteric inoculation as carried out in the British Army. There are, generally speaking, three methods of diagnosing these diseases: (1) clinical, (2) serological, (3) bacteriological.

Hæmoculture.

It is admitted that the bacteriological method, when successful, is the most reliable. In fact, *the only absolutely indisputable evidence of active enteric infection is successful hæmoculture.* The one argument against this otherwise ideal method of diagnosis is the frequency with which the bacteriologist draws a blank in cases in which there is convincing clinical and serological evidence that the patient is suffering from an enteric infection.

The explanation of this frequent failure of hæmoculture is, of course, that the period of bacillæmia (i.e., the period during which living bacilli are present in the blood) is confined to the early stages of the illness. The period of bacillæmia appears to be shorter, on an average, in paratyphoid A and B fevers than in true typhoid fever. In my experience the bacteriologist is rarely successful in the paratyphoids after the tenth day of disease, and in many of the attacks of short duration (7 to 10 days of fever) hæmoculture even at an earlier stage is unsuccessful. On the other hand, in true typhoid fever blood culture is successful even at the end of the second or into the third week of illness.

Now, it is well known that many cases of "enteric," especially the milder paratyphoids, do not come under observation till the second week of the disease, and so it happens in practice that blood culture (which, theoretically, if every case were examined with faultless technique sufficiently early in the illness should provide a correct diagnosis in 100 per cent. of cases) fails in a majority of the cases. It also follows that if the bacillæmia of true typhoid is, on an average, of longer duration than that of the paratyphoids blood culture as a method of diagnosis will exercise a selective influence in favour of true typhoid as against the paratyphoids.

Further, it is well known that paratyphoid A fever is much more liable to relapse than paratyphoid B fever. Each relapse means another period of bacillæmia and affords the bacteriologist an even better opportunity for successful blood culture than the original attack because the patient is usually under observation from the *first day* of his relapse. Hence successful blood culture exercises a selective influence in favour of paratyphoid A as against paratyphoid B. It may be argued that as relapse is also more common in "A" infections than in "T." infections the extra opportunities for successful hæmoculture in relapsing "A" infections so provided will counterbalance the longer average period of bacillæmia of "T." infections.

This is a matter which can only be settled by a large mass of suitable data, but it is my opinion, based on the results of several hundred successful and unsuccessful blood cultures, that the *Bacillus typhosus* is isolated in a larger percentage of cases of *typhoid fever* than the *Bacillus paratyphosus A* is from cases of *paratyphoid A fever*, and that the percentage of cases of *paratyphoid B fever* in which the *Bacillus paratyphosus B* is isolated from the blood is smaller than either. These considerations partly explain the discrepancies between figures obtained by bacteriological and serological methods of diagnosis.

Clinical and Serological Data.

In the remaining majority of all the cases of "enterica" in which hæmoculture is unsuccessful, we have to fall back on clinical and serological observations for a diagnosis. As all clinicians and bacteriologists (with certain notable exceptions) are aware, both these methods of diagnosis are beset with fallacies, and enteric statistics based solely on *one* of these methods are bound to be fallacious. Clinical observation alone cannot, of course, afford a *differential diagnosis*, but many bacteriologists are inclined to view with suspicion even a *general diagnosis* of "enteric" which rests on clinical observation only. Many clinicians, on the other hand, have no faith in the diagnostic value of agglutination tests in inoculated soldiers. This mutual distrust depends on ignorance of the valuable information which can be obtained by careful and repeated observations by both methods; and it is my opinion that, in cases which are "negative" bacteriologically, diagnosis should rest on combined clinical and serological observations, and not as a rule on the results of one or other method alone.

Unfortunately, this necessity for the coördination of clinical and serological data in these cases is not generally recognised, and bacteriologists are much more at fault in this respect than clinicians. For example, Major G. Dreyer, professor of pathology in the University of Oxford, and Captain E. W. Ainley Walker, lecturer in pathology in the University of Oxford, teach that if agglutination tests are carried out by a strictly quantitative technique (e.g., "Dreyer's technique") at suitable intervals throughout the illness, in inoculated patients, the results so obtained suffice in themselves to determine in every case whether the illness is typhoid fever or not. The fact that Dreyer and Walker have carried out extensive researches on this subject, together with the distinguished academic position which they occupy, gives to their writings a weight which they would not otherwise enjoy. It is hardly surprising, then, that their teaching should be accepted, almost without question, by other pathologists, who, perhaps on account of special interests in other directions, have not devoted so much time and attention to this branch of their subject.

For example, Captain Ernest Glynn, professor of pathology in the University of Liverpool, and Dr. E. Cronin Lowe, pathologist, St. John's Hospital, Southport, contribute an article on the "Serum Reactions of 300 Unselected Cases of 'Enteric' with the Oxford Standard Agglutinable Cultures" (THE LANCET, August 5th, 1916), in which the pathologists' lack of faith in clinical diagnosis and the influence of Oxford teaching are both very apparent. Glynn and Lowe state that their cases arrived from the Eastern Mediterranean with a diagnosis of typhoid or "enteric," and it would appear from several passages in their article that they are under the misapprehension that the term "enteric," as used in the Eastern Mediterranean, was synonymous with "typhoid." "Enteric" was a general term of diagnosis for cases which presented the clinical features of the *enteric group of diseases.* They state that the diagnosis of typhoid was often made in the Eastern Mediterranean on insufficient clinical and bacteriological evidence, and Professor Glynn, in a letter to the Editor of THE LANCET, Nov. 18th, 1916, strongly advocating the use of Dreyer's method as a standard agglutination technique in the army, says—

> "Had Dreyer's method been employed earlier in the war far fewer soldiers would have been invalided home from the East with a diagnosis of typhoid fever."

In these circumstances it may be not uninteresting for a clinician to examine the evidence on which they based a diagnosis of "typhoid fever" in our patients arriving convalescent in England.

Analysis of the Evidence on which Glynn and Lowe Diagnose Typhoid Fever in T.-inoculated Individuals.

The total number of cases examined was 300, of which 162 agglutinated typhoid only. Of these 162 cases, 29 were examined only once and 133 on two or more occasions at various intervals. Amongst the 133 cases, 85 showed no change in titre and 48 showed some change in titre of which 34 was of the nature of a fall and 13 a rise. (I have failed to trace one case, but that fact is quite immaterial.) An analysis of the 47 (34 + 13) cases showing a change of agglutination titre, together with the interpretations placed upon these changes by Glynn and Lowe, is given in the following table.

A. *Thirty-four Cases showing Fall in Titre.*

Behaviour of T. inoculation agglutinin.	*Interpretation (Glynn & Lowe).*
(1) Six cases (all inoculated more than a year before) examined each on three or more occasions showed a steady fall of titre of at least 2 tubes.	(1) "In our opinion conclusive evidence of a recent typhoid infection."
(2) One case, first examined six weeks after convalescence, showed a titre of 50 which fell to 0 in seven weeks.	(2) "This was also probably a case of typhoid infection."
(3) The remaining 27 cases all fell one tube only. "As this fall was so slight, it is in the majority of cases most probably due to a gradual normal disappearance of inoculation agglutinins, or to technical error, and not to active typhoid infection."	(3) In the summary one half of these (i.e., 14 cases) are assumed (!!) to have been infected with typhoid.

B. *Thirteen Cases showing a Rise in Titre.*

(1) Interesting details are given of three cases. No. 8. (Inoculated more than a year before.) Showed a 600 per cent. fluctuation of the T. agglutinin with its maximum about the seventh week of convalescence. No. 9. Showed a 300 per cent. fluctuation of the T. agglutinin with maximum about the eleventh week of convalescence (inoculated more than a year before). No. 10. Showed a fluctuation of over 1000 per cent. with maximum about the fifteenth week of convalescence (inoculated May, 1915).	(1) "In our opinion, this change in titre, *although it was unassociated with any pyrexia*, is strong evidence of recent typhoid infection. It suggests the possibility that the patients are carriers, at any rate in Case 10, but no typhoid bacilli have been isolated after at least four examinations of the excreta."
(2) One case rose 2 tubes.	(2) "Probably from infection."
(3) Two cases rose 2 tubes and seven cases 1 tube each.	(3) "Probably from technical error or change of emulsion denominator."

Criticism.

To sum up, Glynn and Lowe have serologically "diagnosed" typhoid fever in 25 T.-inoculated soldiers on results obtained by the use of Dreyer's technique. In 6 of the cases the diagnosis was regarded as a *certainty*, in 5 a *probability*, and in 14 was only an *assumption*. It is the purpose of this criticism to consider the value of the evidence on which these diagnoses rested.

Before any diagnostic significance can be reasonably attached to a rise or fall in agglutinin titre, it is first of all necessary to be certain that such rise or fall is not due simply to *technical error*. The margin of error of the technique in agglutination work is a point the importance of which has not escaped Glynn and Lowe's notice. In fact, they have kept it constantly in mind, and in six passages in their article they admit that changes in titre of 1 tube (and in 2 cases of even 2 tubes), are possibly or probably due to *technical error*. In directing attention to this source of fallacy Glynn and Lowe are likely to incur the disapproval of the author of the method, but they will, I believe, receive the hearty approval of the majority of bacteriologists.

The second important point *is the diagnostic value which attaches to an actual agglutinin fluctuation in an inoculated individual*. Their interpretations are clearly based on the belief that an agglutinin fluctuation of greater or less extent has a *pathognomonic significance*. In this they are accepting the teaching of the Oxford school of pathology. But Dreyer and Ainley Walker (as quoted by Glynn and Lowe) found that—

"if an animal which has been immunised some weeks or a month or two before with a particular micro-organism *be inoculated with a non-lethal dose of a vaccine prepared from some other micro-organism* its agglutination titre for the first micro-organism exhibits a new rapid rise of greater or less extent and pursues a curve similar to the ordinary inoculation curve,"

—which discovery affords strong *a priori* grounds for believing that if a soldier, who has been immunised against typhoid fever, *suffer infection with some other virus* his T.-inoculation agglutinin titre *may* exhibit a new rapid rise of greater or less extent and pursue a curve similar to the ordinary inoculation curve. It obviously points to a possible source of fallacy which the Oxford pathologists do not appear to have taken sufficiently into consideration.

The three cases of which Glynn and Lowe give details—that is, Nos. 8, 9, and 10, showing fluctuations of 600 per cent., 300 per cent., and 1000 per cent. respectively in the T.-agglutinin titre of the blood with maximum about the seventh, eleventh, and fifteenth *weeks* respectively of *convalescence*, have a very important bearing on this question. In my experience an agglutinin response to infection usually attains its maximum about the end of the third week from the onset of the illness. Dreyer and Walker state that the maximum almost invariably falls within the period of sixteenth to twenty-fourth days from onset of disease. This "period of expectation" is a point to which they appear to attach great importance. It would therefore appear that an agglutinin fluctuation attaining its highest point so late in convalescence cannot have had any relation to the original illness, whatever that may have been.

Glynn and Lowe put forward the very interesting suggestion that the patients were *carriers*, though no typhoid bacilli were found after at least four examinations of the excreta. This possible explanation appears to have been suggested to their mind by the fact that they observed an intermittent paratyphoid *carrier* who showed "remarkable variations in titre." Whatever be the explanation, these remarkable variations in agglutinin titre were demonstrated by Dreyer's method in circumstances which preclude the possibility that the patients were suffering from *active infection*. They may therefore be taken as disposing of the idea that the agglutinin fluctuation in an inoculated individual can be regarded as a pathognomonic sign of active infection.

It is my opinion that in not one of the 25 cases which Glynn and Lowe "diagnose" as typhoid fever by "Dreyer's method" have they adduced convincing evidence that the patient was suffering or had suffered from typhoid fever and that in the majority of these cases the evidence was totally inadequate. One half of the 27 cases in which the T. agglutinin fell only one tube are "assumed" to be typhoid, apparently on the sporting ground that they considered the "odds were even," and with the object of making their results correspond with Archibald's figures from blood cultures. For reasons already explained, the results of blood culture are likely to give an unduly high proportion of "typhoids."

Additional Fallacies.

Additional fallacies of a grave nature are introduced when Dreyer's technique is employed by workers who have either failed to appreciate, or who deliberately ignore, the principle which underlies Dreyer's method. These are evident in results published by Dr. R. Donaldson and Miss Barbara Clark in THE LANCET of Sept. 23rd, 1916. It is now nearly a year since this paper appeared and, so far as I am aware, no exception has been taken by Dreyer and his co-workers to their method of employing his standardised emulsions or to their method of interpreting the results obtained, although in the meantime no opportunity has been missed of emphasising the shortcomings of other methods. It would therefore appear that the results referred to meet with at least the tacit approval of the Oxford pathologists.

The standard agglutinable cultures issued from the Oxford laboratory were used exclusively, but it is interesting to note that, for reasons frankly alluded to in their article, they did not follow the "directions" for making the dilutions. This fact, however, is of minor importance and has a bearing on the present argument only in so far as the resulting serum dilutions differed from Dreyer's progression. Donaldson and Clark's dilutions were, in the first four tubes, 1 in 27, 1 in 54, 1 in 120, 1 in 150, a further series being put up if the end-point was not reached in 1 in 150. *It will be noted that the fourth dilution represents a 25 per cent. increase only on the third.*

It is, however, of prime importance to my present purpose to direct attention to the fact that no notice was taken of the "*Reduction Factors*" on the labels of the bottles of standard emulsion used. In regard to this point they state—

"As, with few exceptions, all the sera were examined by the volumetric method and not that recommended by Professor Dreyer and his colleagues, no attempt was made to interpret the results, hence the varying sensitiveness of the bacillary suspensions was not reckoned with."

The mere fact that Donaldson and Clark considerably modified the technical details of the method did not in any way preclude the possibility, nay, the absolute necessity, of reducing their results to a comparable basis by the use of the "reduction factor." It is difficult to follow what they mean by the statement that "no attempt was made to interpret the results." Although no attempt was made to reduce their results to standard agglutinin units and so render them fit for interpretation, they did proceed to interpret the raw results. In doing so they came to conclusions which are, in my opinion, totally fallacious.

Interpretation of these Fallacies.

This criticism refers solely to the evidence on which they diagnosed typhoid fever in patients who had previously been inoculated against typhoid (T. vaccine)—that is, 15 cases in Group 1, Section 2, of this series. Donaldson and Clark state that:—

"When the cases began to come in from the Mediterranean towards the end of 1915 it speedily became evident that the clinical diagnosis was quite untrustworthy."

The mistake in their opinion was too large a percentage of "*typhoids*." They state, however, that the great majority of their cases arrived with a diagnosis of "enteric," so that it is obvious that they, too, are under the misapprehension that the term "enteric," as used in the Mediterranean in 1915, is synonymous with "typhoid," whereas it was used as a term of general diagnosis for cases which presented the features of the enteric group of diseases (typhoid and paratyphoid A and B). As a matter of fact, the diagnosis of "typhoid fever" was rarely made in the Mediterranean because true typhoid fever was rarely met with—such is the remarkable prophylactic efficacy of antityphoid inoculation as carried out in the British Army.

Donaldson and Clark claim as typhoid infections all those cases (15 in number) which, as a result of two examinations at various intervals, showed a variation in the T. agglutinin titre of the blood. How absurd such a claim is may be readily understood by carefully following out their analysis of these cases. Of the 15 cases which showed a variation in titre in two cases the variation was of the nature of a rise.

"As these patients were not infected with paratyphoid bacilli, so far as we know, we claim them as genuine cases of typhoid fever. One had been inoculated eight months before and showed a rise of three tubes in 16 days, followed by a drop of two tubes after a 77-day interval. The extent of the rise in both cases suggests that it was not due to any variation of sensitiveness on the part of the standard cultures used, *supposing for argument's sake that the same batch of culture was not used on both occasions*." (The italics are mine.)

Table VII. of their article shows that the fluctuations in titre referred to in these two cases took place *three and a half months from the onset of the illness*, so that, whether they were "due to any variation of sensitiveness on the part of the standard cultures," or represented real fluctuations in the T. agglutinin content of the blood, their diagnostic significance is practically nil, unless the patients were relapsing (and no mention is made of relapse). In other words, the educated immunity apparatus of a T.-inoculated individual does not take three and a half months to get under way in responding to the stimulus of a T. infection. Donaldson and Clark must look elsewhere for an explanation of these fluctuations—and I would suggest a careful consideration of the possible combined effect of the "reduction factor errors" and "technical errors."

The remaining 13 cases showed a *decline* in the agglutination titre.

"As this decline occurred in the short average interval of 17·7 days, the first reading being taken on average 1·5 months from the onset, we believe we are justified in calling them cases of typhoid infection."

In 8 of these 13 cases the titre fell one tube only. Even if the same batch of emulsion has been employed throughout, a fall of one dilution might quite feasibly be due to technical error, and is in any case totally inadequate evidence of active typhoid infection. But when one considers that this change may represent only 25 per cent. in titre, and that the second examination may have been carried out with a batch of emulsion having a lower "reduction factor" than that for the first examination it becomes apparent that the fall in titre may have actually represented no change or even a rise in the T. agglutinin in the blood. In these circumstances the idea of basing a diagnosis of T. infection in a T.-inoculated patient on such evidence is altogether grotesque.

There remain to be disposed of five cases in which the titre fell two or more tubes. The only particulars supplied regarding these are:—

1. They were inoculated respectively 21, 12, 11½, 11, 9 months previous to date of examination.
2. The average time interval between their two readings was 21·1 days.
3. The average time from onset of illness at which the first examination was carried out was 1·3 months.

In the absence of more detailed information as to the extent of the fall in titre in each case, and the "reduction factors" of the emulsions used (which latter apparently cannot be supplied), together with the clinical facts, it is, of course, impossible to express an opinion on these cases, but I venture to suggest that the evidence as it stands in their report does not in itself constitute adequate ground for diagnosing them as "typhoid fever."

Consideration of Ainley Walker's Observations.

I have carefully read Captain E. W. Ainley Walker's report to the Medical Research Committee on "The Importance of the Diagnosis of Enteric Fevers by Agglutinin Determinations" in THE LANCET of April 14th, 1917. It contains, *inter alia*, Captain Walker's reply to a letter of criticism (THE LANCET, Dec. 16th, 1916), which I wrote on his report illustrating "The Diagnostic Value of Agglutinin Determinations in Inoculated Individuals" (THE LANCET, Nov. 25th, 1916).

Captain Walker suggests that we are probably much more nearly in agreement than the incisive character of some of my expressions might suggest. If by that he means that we are both deeply impressed with the possibilities of agglutination in the diagnosis of the enteric diseases in military medicine, I agree; and, as our unanimity in this respect was obvious, the relevance of his quotations from "Osler and McCrae," and Grattan and Wood, is not altogether apparent. The quotation from "Osler and McCrae" which emphasises the importance of the agglutination test in the recognition of mild typhoid fever (a point on which we are all agreed), certainly does *not* justify anyone in relying *solely* on agglutination for a diagnosis in inoculated patients, and that was, in substance, the charge which I brought against Captain Walker. If he feels inclined to plead "Not guilty," will he kindly at the same time mention what *other* evidence there is of typhoid infection in Case 4 of his article?

In the quotations from Grattan and Wood I fail to see any relevance whatever to the point at issue.

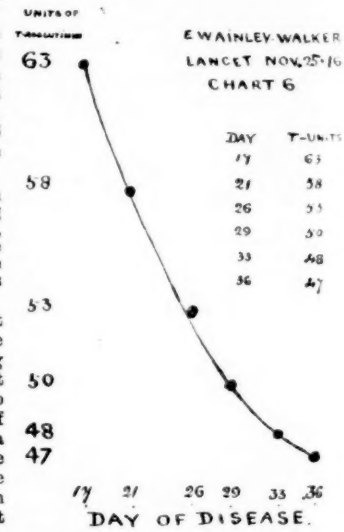
On the limitations of agglutination, both with regard to accuracy and the manner of representing and interpreting the results, I fancy our opinions must differ widely.

Curved versus *Straight Lines of Interpolation in the Graphic Representation of the Agglutinin Fluctuation.*

Captain Walker accuses me, in referring to his interpolated curves and maxima as "figments of the imagination," of being carried away by a "telling phrase." The phrase tells only the truth. Let us, for example, examine closely into his explanation of the maximum between the first and second reading of the T. agglutinin in Case 6 of his article. He says that:—

"As can be seen at once by plotting out on a large scale, a smooth curve through the last five points will not pass through the first."

I have plotted out on a large scale (see the accompanying chart), and find that all six points lie to within 1 per cent. of agglutinin on a smooth curve. The necessity then for the imaginary maximum between the first and second readings, to eke out the smoothness of the curve, does not exist. I therefore claim justification for my statement that this interpolated maximum is "a figment of the imagination." In several cases (e.g., 6, 8, 11, 13) in which the ascertained maximum (i.e., the highest recorded reading) of a heterologous agglutinin is *synchronous with* that of a homologous



agglutinin he has interpolated the former as occurring *previous* to the latter. This is done, apparently, in deference to Note 3c of his article, which states that a heterologous rise is *approximately synchronous with or somewhat antecedent to* the homologous fluctuation.

In Cases 5, 6, 7, 8, 11, 13, Captain Walker draws a curve through one ascertained point!

Interpolation of this kind is, apparently, an insidious process, and a stage is ultimately reached where the interpolator fails to discriminate between ascertained facts and mere assumptions. For example, in Case 9 (E. W. Ainley Walker, THE LANCET, Nov. 25th, 1916), we are informed that "the differential diagnosis (of paratyphoid A infection) rests on the *fact* that in the case of A the maximum has occurred later ....."

and when we turn to Chart 9 we find that the maxima of his curves have not been ascertained, because examinations were commenced too late. The so-called "fact," then, regarding the A maximum is a mere assumption (and, in my opinion, an unjustifiable one). These features of Captain Ainley Walker's curves are quoted here to indicate what I regard as the gross abuse of curved lines of interpolation and interpolated maxima, and to explain the desire I expressed to see the ascertained points on a curve joined by straight lines. Straight lines, though they cannot possibly represent the whole truth regarding a curve, will, if the ascertained points be reasonably numerous, come nearer to a representation of the truth than the abuse of curved ones.

The professed aims of Dreyer's technique are accuracy and uniformity in obtaining and recording agglutination results. It is surprising, then, that Dreyer and his colleagues of the Oxford School of Pathology should adopt a method for the graphic representation of these results which permits of the exercise of so much personal ingenuity of the kind indicated.

The Margin of Error in Agglutination Technique.

This is another fundamental matter which, I think, requires further explanation in relation to Captain Ainley Walker's curves. In all his contributions to the literature of this subject, Captain Ainley Walker appears to me, not so much an exponent of the value of agglutination in diagnosis, as the champion of Dreyer's technique, which he insists is the only technique which fulfils present-day requirements. There are certain points in relation to this technique which seem to me not to have been satisfactorily explained, in spite of the numerous articles above referred to.

The essence of Dreyer's technique is, so far as I understand it, the *standardisation of emulsion*, and the objects of standardisation are, I believe, (1) that the results of successive observations on the blood of a patient should be strictly comparable *inter se;* (2) that the results of observations made, say, at Timbuctoo should be strictly comparable with those obtained at Oxford. The first object is *necessary* in order to demonstrate the agglutinin wave of active infection in an inoculated patient; the second is *desirable* in the interests of uniformity and in order that a large mass of comparable material be available for statistical purposes. Both of these are undoubtedly worthy objects, but whether they can be attained to the degree which Dreyer and his colleagues hope or believe is a matter which is open to grave doubt.

A good deal of discussion has taken place recently in connexion with various sources of error in agglutination technique. The majority of these are either negligible or easily avoided. But it is well known to everybody who has done agglutination work that there is one source of error which is considerable and which cannot be avoided—it is the inherent error which arises from difficulty in determining the "end-point" of agglutination in any series of dilutions. The lowest estimates of this "end-point error" which I have seen are indicated by Dreyer and Inman (THE LANCET, March 10th, 1917), where they state that differences of as little as 12 per cent. to 15 per cent. of agglutinin can be detected; and by Walker (THE LANCET, Nov. 25th, 1916), who states that Dreyer can discriminate between different degrees of agglutination produced by differences of about 13 per cent. of agglutinin. We may take it, therefore, that the "end-point error" is anything up to 12 per cent. to 15 per cent. of agglutinin.

Now the process of standardisation, whether carried out at the Standards Laboratory, Oxford, or at Timbuctoo, according to the "Directions for Standardisation" issued from the Department of Pathology, University of Oxford, involves the determination of the end-point of agglutination of each batch of emulsion against standard serum, and is therefore subject to this "end-point error" of anything up to 12 per cent. to 15 per cent. of agglutinin, which may in this case be called the "error of standardisation." By repeating the process many times and taking the mean of all the results the "error of standardisation" could, no doubt, be reduced. But the directions for standardisation contain no such advice, so that it appears to me fair to assume that the error of standardisation is anything up to 12 per cent. to 15 per cent.

In making a series of observations on the blood of an individual with different batches of standardised emulsion having different reduction factors, it is obvious that the results, reduced to standard agglutinin units, are subject to the above two sources of error—that is, the "end-point error" and the "error of standardisation." It is fair to assume that these two errors will sometimes neutralise each other, and sometimes be cumulative; and they may with one batch of emulsion be cumulative in the direction of over-estimation, and with another batch of emulsion in the direction of under-estimation. The total possible error from this cause alone will therefore be seen to be quite considerable.

The error of standardisation can, of course, be at once eliminated by the simple expedient of making all subsequent examinations on any given case with the same batch of emulsion as was used for making the first examination. This is an elementary precaution which I have used in agglutination work ever since I became aware of the possibility of error from differences in the agglutinability of different subcultures from the same stock. It requires only a little organisation in the laboratory. But no such advice is given in the directions for the use of Dreyer's emulsions. Any such advice would, of course, amount to a confession of failure of the principle of standardisation of emulsion, at any rate in so far as obtaining strictly comparable results from successive observations on the same patient is concerned.

If the above argument (which appears to lead to the logical conclusion that Dreyer's technique is subject to an error of double the ordinary end-point error of other and simpler techniques), contains some fallacy (of which I am honestly unconscious), I hope Captain Walker will point it out and explain it. On the other hand, if it represents the truth, can Captain Walker explain the apparent immunity from any such margin of error which his curves appear to enjoy?

The Interpretation of Results.

The interpretation of results is, in the present state of our knowledge, by far the most important aspect of this problem, and it is in regard to this matter that Captain Walker's attitude and mine differ most acutely. Captain Walker endorses my plea for judgment and caution in the interpretation of the results of agglutination tests (and if my letter leads to improvement in this respect, it will not have been written in vain), but there is very little evidence in his article of Nov. 25th that he practises such judgment and caution.

In this connexion I would like to direct attention for a moment to Case 12 of his article, which refers to a T.A.B.-inoculated patient. The day of onset of the disease in this case is doubtful, but it terminated abruptly on the first day of observation by a fall of temperature from 102° F. to subnormal. This was accompanied by a 50 per cent. fall of the T. agglutinin. On this evidence Captain Walker diagnoses "typhoid fever." After four days of normal or subnormal temperature there is another period of pyrexia lasting four days, during which the B agglutinin shows a 300 per cent. fluctuation, *with a maximum apparently on the second day of disease*, which is markedly outside the so-called "period of expectation"—16th–24th day. On this evidence Captain Walker diagnoses "Paratyphoid B fever." The weakness of both these diagnoses clinically and serologically is only too apparent, yet no doubt appears to have arisen in Captain Walker's mind regarding them.

I have very carefully read the letterpress attached to Case 10 along with the whole of Note 3. I have brought to bear on this case a not inconsiderable personal experience of the behaviour of agglutinins, and have discussed the case with several competent bacteriologists. The result of all this is that I have failed absolutely to see that this is "clearly a case of paratyphoid B infection."

In its simplest terms the question is: "Has the agglutinin fluctuation in an inoculated patient been established as a *pathognomonic sign* of enterica?" Captain Ainley Walker's attitude implies that he thinks it has. To establish the agglutinin wave as a pathognomonic sign for the diagnosis and exclusion of enterica it is necessary to prove: (1) that it is present in every case of undoubted enterica (positive proof); (2) that it is absent in all conditions of health and disease which are clearly not enterica (negative proof).

1. *Positive Proof.*

Captain Walker quotes a passage in my letter of Dec. 16th, 1916, which, he says, expresses clearly exactly what ought to be done in order to obtain the necessary positive proof, and then proceeds to say:—

"But Captain Garrow appears to have overlooked the fact that this fundamental work is precisely what has already been done on a very considerable scale. And there comes a time in the conduct of investigation when the evidence accumulated seems to be sufficient to convince observers that the problem may in certain aspects be regarded as solved. Now the evidence obtained by Dreyer and his co-workers in a very long series of cases is that *in every case* bacteriologically proved to be typhoid or paratyphoid B, and also in similar cases of paratyphoid A (since the low level of agglutinin titre found even at its maximum in many cases of this infection was fully recognised), the diagnosis independently arrived at by means of Dreyer's method was *proved* to be correct. Results of such a character may fairly be termed a *uniformly accurate diagnosis*."

I would like to assure Captain Walker that I have not overlooked this fact, nor have I overlooked the fact that a large proportion of the work referred to was on paratyphoid fever in patients who had been inoculated against typhoid only. I possess abundant evidence of the same kind in favour of a technique which was not Dreyer's. But evidence of that kind is of relatively little value, for it is now well known that a strictly quantitative technique is *not necessary* for the diagnosis of these cases by agglutination. Accurate quantitative methods are called for only in the diagnosis of an infection against which the patient has been inoculated—that is to say, T. infections in T.-inoculated patients and any of the three infections in triple-inoculated patients. Strictly relevant "positive proof" of this kind accumulates more slowly, such is the efficacy of inoculation in preventing these diseases (especially typhoid fever). What evidence there is, is in favour of the value of agglutination in the diagnosis of "enterica," although the correct differential diagnosis of the three diseases included under the term is not *always* possible. Another method of controlling agglutination results to obtain "positive proof" is *careful* clinical observation. The advantage of this method is that it is applicable in a larger number of cases. Its obvious disadvantage is that it has not the same absolute value as positive blood-culture controls.

2. *Negative Proof.*

Proof of the uniform absence of the agglutinin fluctuation in conditions of normal health and disease other than enterica is as necessary as proof of its uniform presence in enterica. It implies a great deal of patient investigation and until a large mass of control work of this kind has been worked out it is impossible to attach a *pathognomonic significance* to a typical typhoid agglutinin reaction in an inoculated individual. It was failure to recognise this which led Captain Walker to diagnose Case 4 of his article as one of typhoid fever, although the clinical facts of the case put a diagnosis of typhoid fever practically out of court. I have asked Captain Walker three definite questions (THE LANCET, Dec. 16th, 1916) in relation to this diagnosis, but no definite replies are forthcoming. Instead of answering my questions he makes an unnecessary repetition of the facts of the case, none of which renders the diagnosis of typhoid possible, nor the diagnosis of malaria improbable, and concludes with the following remarks:—

"Captain Garrow writes in a way that might convey the impression that he supposes every brief tertian periodicity of pyrexia with a chill at the onset to be necessarily of malarial origin. But he is, of course, aware that this is not the case. Repeated chills may occur, with or without marked periodicity in various stages of enteric fever (to go no further afield), *vide* Osler and McCrae, loc. cit., p. 115, where a chart of enteric fever is given, *showing seven successive periodic chills*. (*Cp.* also Osler and McCrae, p. 105, and Allbutt and Rolleston's 'System of Medicine,' 1905, vol. 1, p. 1108 and p. 1132)."

I hoped that my criticism of Case 4 was sufficiently incisive to leave no doubt as to my impression of the clinical significance of tertian periodicity, which is clearly stated by Manson in the following words ("Text-book of Tropical Diseases"):—

"*Tertian and Quartan periodicity occur only in malarial diseases*; when either is thoroughly established, its presence is almost conclusive as to the case being malarial. It is otherwise with quotidian periodicity." (The italics are not mine: they occur in "Manson.")

In the case quoted by Captain Ainley Walker from "Osler and McCrae" *the seven successive periodic chills* occur on *seven successive days*—that is to say, the pyrexia of this case shows *quotidian periodicity*, which is common in a great number of different diseases, and has therefore practically no diagnostic significance. In quoting this case, then, Captain Walker is singularly unfortunate, for it would appear, although it is hardly credible, that he not only fails to appreciate the clinical significance of tertian periodicity, but that he does not even understand the meaning of the term. It would have been easy for Captain Walker to quote cases of typhoid fever *occurring in malarial patients*, in which the impress of periodicity left by a previous malarial infection on the constitution of the patient (Manson) is displayed at some period (at the beginning, in the middle, or towards the end) of the fever by tertian periodicity; but I do not think that he will find either: (1) a case of typhoid fever which displayed well-marked tertian periodicity at some period of the illness in a patient in whom the possibility of a previous malarial infection can be excluded; or (2) a case of typhoid fever, proved by blood culture, whether in a malarial or non-malarial subject, in which the temperature chart displayed the phenomenon of perfect tertian periodicity *from beginning to end of the fever*, as in Case 4 of his article.

Summary and Conclusions.

1. Glynn and Lowe, and Donaldson and Clark take exception to the insufficient evidence on which "typhoid fever" was diagnosed in the Eastern Mediterranean.

2. The former have serologically "diagnosed" 25 and the latter 15 cases of "typhoid fever" in antityphoid inoculated convalescents from the Mediterranean. These represented respectively about 16 per cent. and 13 per cent. of the cases believed to be "enteric" (i.e., typhoid or paratyphoid) in their series. This proportion of true typhoid fever is higher than ever actually occurred in the Mediterranean.

3. In not one of these 40 cases is there convincing evidence that the patient did, in fact, suffer from a *Bacillus typhosus* infection, the evidence in a majority of the cases being grotesquely inadequate.

4. The unduly large proportion of true typhoid "diagnosed" by Glynn and Lowe, and Donaldson and Clark can be explained by the facts that the majority of their cases were examined at a stage of the illness (late convalescence) when agglutination results are liable to be fallacious, that they followed the Oxford teaching with regard to the diagnostic significance of an agglutinin fluctuation, and that they even attached diagnostic significance to fluctuations which were possibly due to technical errors.

5. Their results do not bear out Professor Glynn's belief that, "Had Dreyer's method been employed earlier in the war far fewer soldiers would have been invalided home from the East with a diagnosis of typhoid fever." On the contrary, had Dreyer's technique been adopted, together with the teaching of the Oxford School of Pathology on this subject, the number of soldiers invalided home from the East wrongly diagnosed as typhoid would, in all probability, have been far greater.

6. The results of Glynn and Lowe, and Donaldson and Clark, and Ainley Walker are sufficient to refute even the most modest interpretation of the claim that agglutination tests alone "can be made to furnish a uniformly accurate diagnosis in cases examined during active infection" (E. W. Ainley Walker, THE LANCET, Nov. 25th, 1916, and April 14th, 1917). It cannot be too strongly insisted upon that agglutination tests (by any method) cannot be relied upon solely to furnish a diagnosis of enteric infections against which the patients have been inoculated

7. The official adoption of Dreyer's technique as a standard agglutination technique in the Army, together with the teaching of the Oxford School of Pathology as to the diagnostic significance of an agglutinin fluctuation in an inoculated soldier would be disastrous to enteric statistics in the Army.

SOME PRACTICAL NOTES ON THE

TECHNIQUE OF CONDENSER TESTING IN NERVE INJURIES.

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THE present writer has now used the Lewis Jones instrument—either in its original or in a modified form—for nearly three years, and has examined some hundreds of cases. His experience as regards details of technique may therefore perhaps be of value to those who are beginning such work.

Relative Precision of Instruments.

The faradic coil is still quite a popular instrument for nerve and muscle testing on account of its universality, its cheapness, and the ease with which it can be manipulated. Nevertheless, it is suitable only for the roughest work, for the following reasons:—

The nature of the response of a muscle to electrical stimuli is determined chiefly by (1) the *length* of the impulse used, (2) the *voltage* at which it is delivered, and (3) by the *rate* at which successive impulses follow one another.

(1) The length of impulse given by a faradic coil is governed largely by the nature and working of the interrupter. It varies between 1/600 and 1/1200 of a second.

(2) Voltage is determined by that of the current supplied to the primary; by the number of turns in primary and secondary; and, in part, by the method of interruption.

(3) The rate of "make and break" varies within wide limits.

The above remarks apply to "medical coils" as ordinarily supplied. One such coil, working "all out," may quite fail to stimulate a given muscle; another supplied by a higher voltage, or built to give a more powerful current, may excite the same muscle with ease.

It would be possible to standardise coils to a certain extent, but at the best their range would be very limited, and it would be impossible to stimulate muscles whose nerve-supply was very seriously interfered with. The question is, however, purely academic, for there is no such thing as a standardised coil upon the market.

On the other hand, the testing apparatus introduced by the late Dr. Lewis Jones, and modified by the present writer, is an instrument of precision.

The condensers used are of the values originally suggested by Dr. Lewis Jones. They have already secured sufficient recognition to be looked upon as a standard.[1]

In the first models the condensers were charged and discharged by means of a metronome, make and break being effected by silver rods dipping into mercury cups. This arrangement permitted only of "single twitch" methods; a tetanising current could not be produced.

In the modified instrument made by Messrs. Watson, Limited, charge and discharge is effected by a motor-driven break, which consists of two vulcanite disks having copper sectors, against which carbon brushes are pressed. Double disks are used so that the patient's circuit is earth free, which was not the case in the early instruments. Any number of impulses between 1 and 30 can be delivered per second.

The Testing of Muscles.

When testing muscles it is usually desirable to use the "single twitch" method. *Rate of discharge should not exceed one per second*, otherwise the nature of the response becomes affected. The voltmeter should be carefully set at 100. All condenser instruments must be kept scrupulously clean and in perfect order. It is their one disadvantage that they require much attention. The carbon-copper rotary break is the result of a long series of experiments, and is perfectly satisfactory so long as it is fairly dealt with. It is desirable to have a measuring instrument in circuit with the patient so as to make sure that each condenser is giving its proper kick. I have no doubt that many apparent discrepancies in the results of condenser testing are to be put down to the use of imperfectly working apparatus. An ordinary milliampèremeter, if placed in circuit with the patient, will show a kick of its needle with each discharge, which is quite noticeable after the sixth or seventh stud, and is well marked from No. 10 onwards. It is possible to ascertain and mark the proper range of needle-movement for the higher condenser values. This movement will be the same for identical makes of milliampèremeter, but is not an absolute reading, as it depends to some extent upon the balistics of the particular instrument employed. Moreover, it is not possible with an ordinary instrument to measure the "kick" for the first six condensers. These earlier numbers are extremely valuable in the investigation of minor degrees of injury and in helping to differentiate between functional and organic paresis. A milliampère-meter specially designed for the condenser instrument can now be obtained.

This short paper is intended to deal chiefly with the actual use of the condenser instrument from the mechanical and electrical sides; for details as to position of electrodes, preparation of the patient, &c., and the interpretation of results I must refer readers to a paper read by me before the Section of Surgery of the Royal Society of Medicine and printed in THE LANCET of Feb. 19th, 1916. I will, however, take the opportunity of saying that there is increasing evidence that there are certain electrical phenomena which are indicative, on the one hand, of a degree of nerve blockage which can only be dealt with by surgery; and, on the other, of a partial or a recovering lesion.

The method of testing hitherto followed has been to set the voltmeter at 100 v. and to note what length of impulse, or size of condenser, was needed to provoke a just noticeable muscular contraction. A response only to impulses lasting 1/400 to 1/200 sec. indicates either that there is *or has been in the more or less recent past* a complete blockage of all motor impulses. The fact that the responses at 100 v. might remain unchanged, even when some amount of clinical recovery had taken place, detracted from the value of the condenser method in helping to make a prognosis in lesions some months old. I have recently found, however, that the condenser responses in recovering lesions are only *apparently* unchanged.

The "Voltage-duration Test."

In the case of a muscle whose nerve is definitely known to be severed, a doubling of voltage will enable a condenser of 50 per cent. less capacity to be used, but any reduction of capacity—or impulse-duration—beyond this results in a failure to provoke contraction. Thus, a contraction provoked by a condenser of 2 microfarads (No. 12, L. J. scale) at 100 v. may be reproduced by one of 1 microfarad at 200 v. But 0·5 microfarad at 200 v. gives no result. In a recovering lesion, however, although anything less than 2 microfarads at 100 v. may fail, *yet at 200 v., 0·5, or even 0·25, may produce a good response.*

Stated a little differently: If a raising of voltage from 100 to 200 v. enables the total energy—i.e., product of capacity × voltage—required to produce a contraction to be reduced by 50 to 75 per cent., it may be taken that the muscle is not entirely cut off from motor impulses. This reaction is characteristic of partial blockage or of a stage in the recovery from complete blockage.

Within the limits of my experience this reaction has proved of absolute value, but its absence does not necessarily mean that recovery cannot occur. When, however, it is not present, and the muscular contractions gradually fail, so that after about a dozen impulses (at rate of one per second) they are no longer visible, I have so far never seen a case recover apart from operation.

Years ago the observation was made that the faradic response was sometimes recovered before there was any improvement in the galvanic reaction; this is, no doubt, due to the fact that the faradic impulse, though of short duration, is as a rule delivered at a higher voltage than the long galvanic stimulus.

The modified Lewis Jones apparatus is now provided with a switch which enables the current to be changed from 100 to 200 v. Studs Nos. 12, 11, 9, 7, 6 afford capacities, or

[1] The Lewis Jones scale of condenser values is as follows:—

No.	Capacity (microfarad).	Discharge duration (second).	No.	Capacity (microfarad).	Discharge duration (second).
1	0·016	1/24,000	7	0·25	1/1,600
2	0·025	1/16,000	8	0·33	1/1,200
3	0·05	1/8,000	9	0·5	1/800
4	0·062	1/6,000	10	0·66	1/600
5	0·08	1/4,800	11	1·0	1/400
6	0·125	1/3,200	12	2·0	1/200

impulse-durations, each of which is half the one immediately preceding, so that it becomes a very simple matter to test for the reaction above described.

I suggest that the test might be conveniently termed the "voltage-duration test" and be recorded as + or −, the former indicating incomplete blockage or a stage in recovery.

The Testing of Nerves.

The above remarks have reference, so far, exclusively to the use of single impulses delivered at a rate not exceeding one per second. This is the method most suitable for testing *muscles*. When *nerves* are to be stimulated, a rapid succession of impulses—not less than 15 or more than 25 per second—is desirable. A milliampèremeter should always be in circuit with the patient. The readings are in this case independent of the make of instrument, and are analogous to those of a milliampèremeter in circuit with an X ray tube, where all inverse current is suppressed. These readings are much more affected by skin resistance than is the case with single condenser impulses. In order to obtain comparable results, care must be taken to see that where the same condenser is used, and the rate of discharge is constant, the milliampère readings also correspond. In practice, provided that the skin is previously soaked for some minutes in hot water, it is found there is not much variation in the resistance offered—i.e., for a given setting of the instrument the same milliampèrage is registered.

It need hardly be said that when a nerve is surgically blocked no amount of stimulation applied to its trunk will cause contraction in the muscles which it supplies. But, short of such blockage, there are all degrees of interference with conductile capacity. It is for the measurement of these that it is so necessary to have a standardised tetanising current, as well as standardised single impulses for the stimulation of muscles. By careful records we are able to say whether the nerve is gaining or losing in conductivity.

Method of Recording Results.

When *single impulses* are used it is understood that their rate of delivery is one per second or less. The condenser required to excite at 100 v. should be noted; then the potential should be doubled and the required capacity again recorded. When using a *tetanising current* the *rate of delivery per second* must also be recorded, and, in addition, the milliampèrage in the patient's circuit.

The modified Lewis Jones condenser apparatus provides for the first time a standardised apparatus which can be used in testing nerve injuries of any degree. Provided that the machine is kept in proper order and that a uniform technique is used in applying it, it is possible for records to be kept which, at any rate, approach scientific accuracy. Nerve cases are frequently sent from one hospital to another, but if records of condenser testings are sent with them the various medical officers concerned need be at no disadvantage in estimating progress.[2] It is therefore highly desirable that wherever possible condensers should be used in the testing of nerve-muscle injuries, and that the set of "capacities" introduced by the late Dr. Lewis Jones should be adhered to. Beginners should at first stick to Lewis Jones's proposed voltage of 100, and later experiment with the voltage-duration test as previously described. The ideal aimed at in making a report should be to enable any observer possessing the necessary instrument to reproduce as nearly as possible conditions under which the test was originally made. The following details should always be given:—

(*a*) As to the technique of application:
(1) Size of electrodes.
(2) Solution used to moisten them.
(3) Points of application.
(4) Any other details as regards amount of soaking in hot water, whether or not the limb was on a relaxation splint, condition of patient as to fatigue, &c. (In general, it may be said that every care should be taken to obtain from a muscle its "optimum response"—i.e., it should be rested, relaxed, warmed, and the skin resistance over it reduced as far as possible.)

(*b*) As to the instrument itself.
(1) Number of stud and time value of impulse (*a*) at 100 v., (*b*) at 200 v.
(2) Rate per second of delivery of impulses.
(3) Where a tetanising current is used in direct stimulation of nerves the milliampèrage in the patient's circuit should always be noted, as it is greatly affected by the skin resistance, much more so than is the case with single impulses at the rate of one per second or less.
(4) It should be noted that condenser discharges have polarity. I have not observed any difference myself as regards which pole is placed over the motor point. The matter may be disregarded in routine work, but should be remembered by investigators.

I close this paper, as I began, with a plea for the standardisation of electrical testing. Exact reproduction of conditions is not always possible and, where different observers are concerned, the "personal equation" will always come in. Experience has amply proved, however, that the unavoidable errors are not sufficient to vitiate the results as a whole. The condenser system has no magical virtue: its value lies in the fact that it has focussed attention upon the utter crudity of older methods. If some other system can be devised giving even greater accuracy the present users of condenser testing will gladly abandon it.

Cavendish-square, W.

[2] Treatment by rhythmically applied tetanising currents can also be detailed in such a manner that it can be exactly reproduced elsewhere.

A CONTRIBUTION TO THE STUDY OF "WAR NEPHRITIS."

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AND
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DURING the six months October, 1916, to March, 1917, 664 cases of "war nephritis" were returned by No. —— General Hospital. During this period there were altogether 173 medical and surgical autopsies, in 53 of which definite evidence of renal disease was obtained.

Of the above 53 deaths 26 occurred in patients diagnosed and under treatment for "war nephritis," giving a mortality for this disease of 4 per cent. for the period under consideration.

In addition to these were 13 others not returned as nephritis, but in some of which the disease was suspected before death—the clinical symptoms in these patients being mainly pulmonary (bronchitis, broncho-pneumonia).

To the above 39 cases must be added 14 others occurring in the group "wounded," in which 126 autopsies were made. The existence of nephritis had been recognised during life in about a quarter of these patients.

It is worthy of note that in the 47 medical cases submitted to autopsy disease of the kidneys was present in no less than 83 per cent.

The kidneys were examined microscopically in every one of the 53 cases and the slides have been numbered and preserved. Sections of the lungs and other organs have also been made in a few instances and are equally available.

"War Nephritis" and "Trench Fever."

In November, 1916, we wrote a short paper under the title of "P.U.O. Trench Fever" on a group of cases which at that time accounted for a large proportion of the cases in the medical division.

The main features of the cases there described were attacks of fever of sudden onset and short duration liable to recur at short intervals—frequently of five days—and associated with severe pains in the legs, back, or head. These patients presented no recognisable blood picture, and no evidence of blood infection could be obtained. This contribution passed through the usual official channels and did not appear until February, 1917.

During the interval between these two dates the picture presented by a general survey of the medical side of the hospital had undergone a remarkable change; the place of trench fever appeared to have been usurped by "war nephritis." Whereas in November, 1916, cases of "war nephritis" were not numerous and quite overshadowed by trench fever, during the winter months examples of the latter disease steadily decreased, and by February, 1917, had almost disappeared from the wards, which were now largely occupied by cases of "war nephritis." It is to be noted that

some 25 per cent. of these cases did not conform to the published description of "trench nephritis"; some presented the clinical picture of broncho-pneumonia, lobar pneumonia, or capillary bronchitis, whilst others were admitted with uræmic coma, uræmic convulsions, or uræmic dyspnœa, without obvious œdema of the head, trunk, or limbs.

The fatal cases occurred without exception among the group simulating pulmonary disease and those admitted with uræmia. This is probably no more than to say that the milder cases—the large majority—recovered and that pulmonary complications and uræmia, though by no means invariably fatal, are the principal causes of a fatal issue in the disease known as "trench nephritis." This view is borne out by the examination of the kidneys in our series of fatal cases.

The experience of last winter shows that the disease at times has a much higher mortality than was suggested in the earlier published accounts.

The question as to whether there is any connexion between "trench fever" and "trench nephritis" we hope to deal with in another communication.

Morbid Anatomy.

The autopsies were carried out in the great majority of the cases within six hours of death. In the few in which the autopsy was made after a longer interval of time we have as far as possible made allowance for any appearances which might be attributable to that fact.

The body generally presented the signs of marked anæmia, with peculiar dryness of the skin. After reflecting the soft parts from the front of the chest the cartilages and rib-ends displayed a peculiar whiteness, in marked contrast with the appearance presented in death from other causes.

Lungs.

A variety of conditions have been met with: (1) Broncho-pneumonia with patches of collapse of varying size, extending in some cases to a whole lobe; (2) areas of consolidation suggesting croupous pneumonia to the naked eye, but which on microscopical examination proved to be lobular in type; (3) in two cases numerous small cavities honeycombing an apex, complicated in one of them by pneumothorax from rupture of a superficial cavity. The bronchial glands were frequently found enlarged, occasionally to the size of a pigeon's egg, but without any signs of breaking down.

Infarcts of the lung presenting the usual naked-eye appearances were met with on four occasions, infarcts of the kidney were associated in two cases, and of the spleen in one.

Pleural effusion was present in the majority of the cases, usually bilateral and frequently accompanied by evidence of pleuritis. In two cases the effusion was turbid. In some cases the effusion was evidently passive and often associated with effusion in other serous sacs.

Microscopical examinations.—Lungs.—Sections were made from six cases showing consolidation, both lobular and lobar. These showed that the lobar consolidation was not croupous in type but confluent lobular, the alveoli being crammed with proliferating epithelioid cells and some blood, with infiltration of the septa. Proliferation of the epithelial lining of the terminal bronchioles was also observed.

In one case (No. 30) besides broncho-pneumonia there were large numbers of yellowish subpleural fibrous nodules about the size of a pea. On section these appeared to be granulomata, containing giant cells, but without any signs of caseation. The significance of this is quite uncertain.

Liver and other Organs.

Liver.—The principal change presented by the liver was a very definite enlargement, with a fatty appearance on section, occasionally associated with congestion. In six cases examined microscopically, early to well-marked fatty degeneration of the cells of the central zones of the lobules was present.

The suprarenals have been noticeably enlarged in a considerable proportion of the cases, especially the cortical portion of the organ. Microscopically, advanced fatty changes were seen to be present in the cortex, the medulla being but little affected.

Spleen.—This was usually somewhat below the normal size and rather tough. In one case the organ was definitely enlarged and in another enlarged and soft. Microscopically the last specimen showed simple hyperplasia of the splenic pulp.

The thyroid gland was always well defined and in some cases distinctly larger than usual.

Kidneys.

These were nearly always enlarged and distinctly flabby. The capsule stripped fairly easily as a rule, but in a few cases (Nos. 16, 22, and 27) it was separated with difficulty. The cut surface presented a cloudy appearance, with eversion of the edges. In Case 46 infarcts were present. In one case in which small suppurative foci were scattered through the renal substance there was no evidence of an ascending infection. In Case 5 there were small contracted red kidneys weighing 123 and 63 grammes respectively. Further reference is made to this case below.

Microscopical appearances.—The following features have been strikingly constant throughout the whole series: (1) Degeneration of the epithelium of the convoluted tubules; (2) absence of interstitial inflammatory changes; (3) absence of glomerular changes except in the seven cases which showed evidence of fibrosis; (4) absence of changes in the collecting tubules.

Convoluted tubes.—The cytoplasm of the epithelial cells is markedly granular, and in many places has been shed into the lumen of the tubule in the form of granular débris. This process, no doubt, accounts in part for the granular organic detritus present in so many of the urines during life and forms the basis of the granular casts which are always present.

The nuclei present one of two appearances—which may be seen in the same or in adjoining tubules—(1) shrinking of the nucleus, which takes the stain quite uniformly and deeply; (2) apparent enlargement, with retention of chromatin network. We have observed nuclei in this condition both in cells of which the cytoplasm has been partially destroyed and also lying free among the granular débris in the lumen of the convoluted tubes. The appearances suggest that the cytoplasm has undergone so rapid a process of destruction as to liberate the nucleus almost unchanged. If nuclei be so set free and excreted in the urine their differentiation from leucocytes might, in our opinion, give rise to considerable difficulty.

Glomeruli.—In most cases these are visible to the naked eye as minute granules on the surface of the freshly cut kidney. On microscopical examination, however, except in the cases mentioned below, we have failed to find any certain evidence of pathological change. The tufts did not appear to us to be swollen or to present any obvious increase in the number of nuclei. Free blood in the capsules has never been met with.

As already stated, changes in the collecting tubules are uncommon and rarely marked. We have frequently met with healthy collecting tubules, side by side with extensively damaged convoluted tubules.

Inflammatory changes.—In contrast with the marked epithelial degeneration, the signs of interstitial inflammation have been singularly insignificant. In the absence of this we are not inclined to look upon the congestion which obtains in certain cases as evidence of inflammation.

In 11 cases (Nos. 5, 14, 18, 19, 21, 23, 26, 28, 31, 34, and 43) there was a varying amount of fibrosis. In two of these there was old interstitial and arterio-sclerotic change; one showed early arterio-sclerotic change alone; six showed recent, but marked, interstitial change; and two showed recent, and more marked, interstitial change.

Case 5, above referred to, died of uræmic coma of sudden onset. He was doing his usual work on the day before admission to hospital, and had complained of not feeling well five days previously. The kidneys in this case were small, with thickening of Bowman's capsule, glomerular fibrosis, thickened arteries, and interstitial fibrosis. These kidneys showed an acute tubular degeneration exactly similar to that described above.

Fatty degeneration.—A definite amount of fatty change of the tubular epithelium was present in every case examined. The amount of change revealed by staining sections with osmic acid was, however, decidedly less than the naked-eye appearances had led us to expect. There was no fatty degeneration in the glomeruli and collecting tubules.

The foregoing evidence that one portion, and one only, of the entire renal unit from glomerulus to pelvis bears the brunt of the disease seems to us to eliminate the probability of a generalised bacterial infection of the kidneys, and equally to suggest that these same convoluted tubules are damaged in excreting a soluble poison, which may or may not be bacterial. How far a similar explanation is valid for the acute tubal nephritis seen in civil practice it is impossible to say. We should add that we have not met with the purely glomerular type of "trench nephritis" described by McNee and Dunn.

Clinical Remarks.

The Urine.—In the acute stages partial suppression is not infrequent, the quantity of urine secreted remaining for two or three days under the litre; later, however, a noticeable feature is the large quantity of urine secreted, even to 3½ litres per diem.

The specific gravity is often low, 1008–1012, but may be as high as 1030 or as low as 1002.

Of the character of the urine in the initial stages we are unable to speak as regards patients coming down the line. As a rule on admission here they are passing only traces of albumin with large numbers of granular, hyaline, or cellular casts. As regards cases arising at this base, the amount of albumin at onset has varied considerably; but it is not usual in our experience to meet with more than a cloud on boiling.

In cases where the initial albumin is high there is usually a rapid fall under treatment, and rarely more than a trace of albumin at the end of a week. But the casts do not diminish to the same extent, and frequently persist in the urine until the patient is evacuated.

Blood is not frequently seen, though in some of the slight cases there is a history of hæmaturia with the onset of the symptoms.

The presence of tube casts in the deposit after centrifuging the urine is most constant. Granular casts are the most common and have been found in every case diagnosed nephritis; hyaline and cellular casts are also met with, and more rarely blood.

The integrity of the glomerular apparatus in association with profound destructive changes in the epithelium of the convoluted tubules seems to afford a reasonable explanation of the free secretion, in these cases, of a urine containing small quantities of albumin and large numbers of granular casts.

The *pulmonary symptoms* which were present in so many of our patients do not in themselves call for any special description. They conform in the main—whether bronchitic, broncho-pneumonic, or due to infarction—to the recognised features of these conditions. We may, however, refer to one or two special points.

Some of the bronchitic cases have shown a remarkable periodicity in the temperature chart and symptoms, looking just as if a trench fever with five-day intermissions had been superimposed on a broncho-pneumonia of moderate severity.

In the case of nephritis occurring in patients with wounds attention has more than once been directed into the right channel by the observations of the surgeon that the patient is not doing well and that his condition is not accounted for by the state of his wound.

It is, perhaps, hardly necessary to insist on the value of anæmia as an indication. Its presence in surgical cases is not infrequently of value in drawing attention to the true nature of the patient's unfavourable symptoms.

Careful inquiry into the previous history sometimes reveals the occurrence of headache, vertigo, with or without vomiting, recurrent attacks of dyspnœa, and lumbar pain at intervals over a period of several weeks or even months. Where such symptoms are complained of a careful examination of the urine is clearly indicated.

We can only very briefly refer in this paper to the question of the possible conveyance of the disease from the sick to healthy. We have notes of at least two of the orderlies of this hospital who have never been to the Front and who contracted typical "trench nephritis" whilst on duty in the nephritis wards here; we also know of at least two other cases in which the disease was contracted at this base; one, a sister in charge of a nephritis ward and the other a laboratory attendant whose duty it was to examine all the nephritis urines. We should have very little difficulty in adding other cases to this list.

The mortality figure of our series of cases—4 per cent.—is, we believe, appreciably higher than that usually met with. It is admittedly difficult to compare one experience with another in this respect. So much depends on the cases which are reckoned as war nephritis. In view of the great frequency of pulmonary complications, we consider that no true mortality figure can be arrived at unless all cases of acute pulmonary disease are carefully examined for albumin and especially for granular casts, and all fatal cases of suspect pulmonary disease submitted to autopsy before exclusion from the nephritis group.

We cannot conclude without expressing our thanks to Lieutenant-Colonel J. C. Jameson, R.A.M.C., for his assistance both in securing material for us and for his kindly encouragement. Our thanks are also due to Colonel W. Pasteur, A.M.S., for his assistance and criticism, to Major C. H. Furnivall, R.A.M.C., officer in charge medical division, and to Captain D. Ross, R.A.M.C. (T.C.), Captain F. G. Gibbs, R.A.M.C. (T.C.), and Lieutenant J. M. Mackintosh, R.A.M.C. (T.C.), for their help.

AN EXTENSION SPLINT FOR THE AMBULATORY TREATMENT OF FRACTURES OF THE FEMUR.

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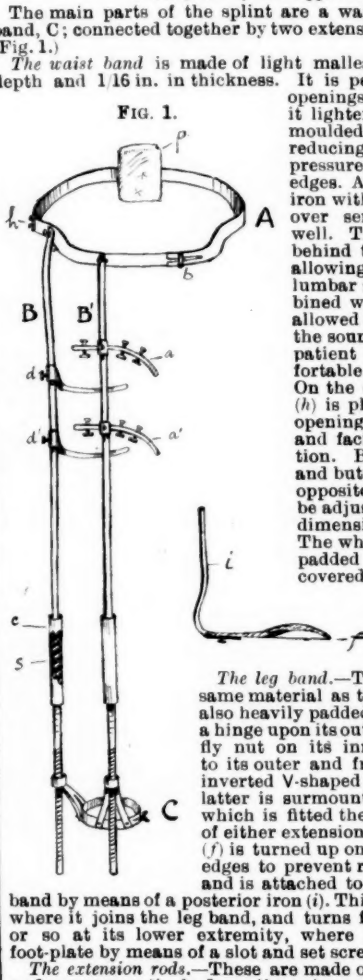
ON account of the tedious course taken by fractures of the femur, and especially those accompanied by a septic wound, a certain number of which fail to unite, the appliance to be described was devised with a view to allowing the patient out of bed a short time after his injury, and at the same time maintaining an efficient extension of the limb. Without doubt the most effective form of extension is that obtained by weight and pulley. The superiority of this method over others lies, I believe, in the constant nature of the pull which the weight exerts, if properly applied no slackening being possible. Other disadvantages of those methods which have one or both of their *points d'appui* over bony parts is the difficulty of obtaining adequate extension without causing pressure-sores, or at least discomfort to the patient. In the method to be described pressure is nowhere exerted over bony parts, and extension equal to from 5 to 25 pounds' pressure or more is readily obtained.

Description of the Appliance.

The main parts of the splint are a waist band, A; a leg band, C; connected together by two extension rods, B and B'. (Fig. 1.)

FIG. 1.



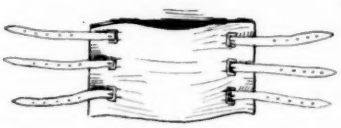
The waist band is made of light malleable iron 1½ in. in depth and 1/16 in. in thickness. It is perforated by 1/4 in. openings in order to render it lighter and more readily moulded to the part without reducing its resistance to pressure exerted upon its edges. A strip of galvanised iron with its edges doubled over serves the purpose well. The band is higher behind than in front, thus allowing flexion at the lumbar spines, which, combined with the movement allowed at the hip-joint of the sound side, enables the patient to assume a comfortable sitting position. On the outer side a hinge (*h*) is placed, which allows opening of the waist band and facilitates its application. By means of a slot and butterfly nut (*b*) on the opposite side the band can be adjusted to the required dimensions and locked. The whole band is heavily padded with felt and covered with leather. A large pad (*p*) protects the centre of the back when the patient is recumbent.

The leg band.—This is made of the same material as the preceding. It is also heavily padded and provided with a hinge upon its outer side and a butterfly nut on its inner side. Attached to its outer and front aspects are two inverted V-shaped pieces. Each of the latter is surmounted by a collar into which is fitted the lower threaded end of either extension rod. The footpiece (*f*) is turned up on its inner and outer edges to prevent rotation of the limb, and is attached to the back of the leg band by means of a posterior iron (*i*). This latter is adjustable where it joins the leg band, and turns forward for 2 inches or so at its lower extremity, where it is fitted to the foot-plate by means of a slot and set screw.

The extension rods.—These are made of 3/8 in. steel tubing and pass respectively down the outer and anterior aspects of the limb. Each makes a forward angle of about 150° with the waist band so that the limb is held in a position of slight flexion at the hip. By means of a turnscrew attachment to the waist band any degree of abduction may be obtained.

The point of attachment of the outer rod to the waist band is about 3 inches behind the anterior superior spine, but on a higher level. In the thigh it lies along a line drawn downwards from the posterior border of the great trochanter. In the latter region it is curved slightly outwards. The anterior rod is attached to the front of the waist band and passes down the centre of the front of the thigh. Each rod is divided at the junction of its middle and lower thirds into two segments, between which a cylinder (*c*) enclosing a compression spring (*s*) is placed. (The tension of the latter is such that a compression of 1 in. requires a pressure of about 10 lb.) The distal extremity of the upper segment is welded to the upper surface of the cylinder. The upper extremity of the lower segment enters a circular opening in the base of the cylinder to impinge upon the enclosed compression spring. This opening in the base of the cylinder holds the lower segment snugly in position, acting as a collar to prevent any side-to-side movement. The lower segments of the rods are threaded for 8 inches or so from their lower extremities. The latter screw into the collars attached to the leg band. Graduated lines, which register the degree of compression of the springs (and consequently the amount of extension employed at any time), are marked upon either extension rod between its threaded portion and the base of the cylinder. *d* and *d'* are two slightly curved metal bars slung from the outer extension rod. They are adjustable to any length of the thigh by means of sliding collars and are fixed in the desired position by means of set screws. Each passes directly backwards for 2 inches or so, and then curves inwards behind the thigh. Upon these Gooche's splinting or a sheet of poroplastic material is laid, a supporting trough being thus furnished posteriorly for the thigh. *a* and *a'* are two similar curved bars adjustable to any level on the anterior rod. The sliding collar of each bar is eccentrically placed, so as to divide the latter into two unequal limbs. The outer limb is nearly straight, and is applied to the anterior surface only of the thigh. The inner is curved and extends inwards to embrace part of the inner as well as the anterior aspect of the thigh. By means of turnscrews (two on inner and one on outer limb of each bar) pressure can be exerted upon Gooche's splinting or a sheet of poroplastic material placed between the bars and the surface of the thigh.

FIG. 2.



In order to further support the posterior and inner aspects of the thigh a broad band of webbing (Fig. 2) passes behind the limb from the outer to the anterior extension rod, being fastened to either by straps and buckles. By means of these cross-bars attached to the extension rods, aided by the band of webbing, the fragments can be controlled and immobilised as effectually as by a plaster cast.

Application of the Splint.

Straps of zinc oxide adhesive plaster 3 in. wide (or bandages and Heussner's glue) are first applied in two series. The lower series consists of four straps applied to the four surfaces of the limb, each commencing above just below the site of fracture and ending below about 3 inches above the level of the tips of the malleoli. A 5 in. length of stout tape is tied by its centre to the distal end of each strap, which is left free for this purpose. The upper series consists of five or six bands, which, commencing a short distance above the site of the fracture, pass upwards over the anterior, outer, and posterior aspects of the limb. The outer straps pass upwards nearly as high as the anterior superior iliac spine; the posterior ones pass over the buttock and back as high as the iliac crest. The ends of the upper series are also left free for the attachment of tape. In the use of adhesive plaster with weight and pulley and other forms of extension there is sometimes difficulty in preventing the plaster from slipping. This is largely due to the fact that only two strips can be applied. For, on account of the presence of the instep and heel, the application of plaster to the anterior and posterior aspects of the limb is prevented. With the method described, as the strapping can be applied to all four aspects of the limb, the strain is divided among four instead of between two. In the case of the upper series five or even six strips can be applied, thus further reducing the strain on each of the several pieces. No trouble has ever been experienced on this account when a good brand of zinc plaster was used in the manner described. The adhesive strapping having been applied above and below the site of fracture and made firm by a few transverse bands round the circumference of the limb, and a snug bandage over all, the splint itself is applied in the following manner: Adjustments to fit the patient are first made by screwing the extension rods up or down until the desired length is obtained. This should be such that the waist band will lie just above the iliac crests behind, and the leg band about 3 inches above the level of the malleoli. The sliding bars on the outer extension rod are then adjusted so that each will lie 3 inches or so on either side of the fracture line. A sheet of Gooche's splinting or poroplastic material is laid upon these and suitably padded. The waist and leg bands are now opened by means of the hinges on their outer sides, and the posterior segment of the former is slipped behind the patient's back just above the iliac crests and along the upper limit of attachment of the adhesive strapping. The posterior protecting pad should lie with its centre over the lumbar spines. The posterior supporting trough slung from the outer extension rod is then slipped behind the thigh, and the posterior segment of the leg band finally placed in position along the lower limit of attachment of the adhesive straps. The appliance is then closed and the waist and leg bands moulded to the parts which they encircle. The double tags of tape attached to the free ends of the adhesive strips should be placed in such a way that one tag lies between the waist or leg band and the skin and the other outside the band. The encircling bands are then locked by a few turns of the butterfly nuts and the tapes drawn taut and tied firmly around the former. The foot-plate may now be fitted to the leg band by means of the posterior iron and adjusted to the foot. The anterior and inner aspects of the thigh in the region of the fracture should next be padded and a sheet of poroplastic material or Gooche's splinting applied. The sliding cross-bars attached to the anterior extension rod are then adjusted and fixed in position. The set screws on the limbs of the former are not screwed down until after extension has been applied.

Application of Extension.

This is gradual at first and is carried out by means of a key which fits the lower ends of the extension rods. A few turns are given to each rod, thus forcing the latter into the cylinders and compressing the springs. The number of pounds pressure exerted is indicated by the graduated lines marked on the extension rods. A pressure of from 8 to 10 lb. is usually sufficient for the first six hours or so. After this it may be increased a few pounds at a time until 15 or 20 lb. is registered. After the primary extension has been applied and the fragments brought into alignment the set screws on both limbs of the anterior sliding cross-bars are screwed down and the band of webbing passed behind the thigh and tightened by means of buckling to the outer and anterior extension rods.

In this way the fragments are firmly held in position and immobilised. Whilst the patient is in bed and recumbent this anterior splinting of the thigh is unnecessary and may be dispensed with until the time arrives for him to be allowed out of bed or for purposes of transportation. When not in use the anterior cross-bars are merely pushed upwards or downwards out of the way and the anterior surface of the thigh left free of support. After a week or ten days the patient may be allowed up seated in a chair and in another week or so may be allowed about on crutches. A boot worn on the foot of the sound side, with heel slightly raised if necessary, combined with the slightly flexed position of the thigh, enables the foot of the affected side to clear the ground. After six or eight weeks the foot-plate may be removed, if the degree of union warrant, and a boot fitted to the posterior iron, the patient being allowed to bear weight upon the foot. In order to prevent compression of the springs a small semicircular sliding collar is fitted to either extension rod so as to lie in contact with the base of each cylinder, being made to grip the rod tightly in the required position by means of a bolt screw. The strain on the upper series of adhesive strapping is relieved by a pair of well-padded leather perineal bands, attached in front and behind to the waist band. In this way the appliance may be made to serve the purpose of a walking caliper-splint. If desired the metal waist and leg bands may be dispensed with entirely and their places taken by plaster casts applied about the waist and calf of the leg. The free ends of the adhesive plaster in this case are merely turned over and incorporated in the plaster cast as it is applied. The extension rods are also fixed in the plaster. The upper ends of these, as well as the collars holding their threaded lower ends, are fitted with perforated or spiked metal flanges to enable them to be firmly secured in the casts.

Advantages Claimed for the Apparatus.

1. That it allows the patient out of bed at an early stage of the case, and should be of particular value in the transportation of cases.

2. There is no pressure over any bony part and the *points d'appui* are taken from either side of the fracture line, thus allowing the maximum amount of extension to be obtained with the minimum amount of force.

3. Plaster-of-Paris, if used, is far removed from the neighbourhood of the fracture, thus preventing its being soiled by discharge or wet by dressings in the case of fractures accompanied by an open wound.

4. Efficient extension of the limb and immobilisation of the fragments are obtained in the erect position. The extension is continuous; any slackening which may occur from slight slipping or stretching of the adhesive, from relaxation of the muscles or stretching of the skin, is at once taken up by the expansion of the springs.

5. The amount of force employed at any time can be gauged by the graduated lines on the extension rods, and any decrease noted and corrected by a turn or two of the latter.

6. There is no trouble caused by the slipping of the adhesive owing to the greater number of bands which can be applied.

7. The appliance can be quickly and easily applied. It can be adjusted to fit any patient, and can be employed from the commencement to the termination of the case.

8. In ununited fractures, where the septic condition precludes any operative fixation methods for several months, it is especially valuable.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

NOTES OF CASE OF SECOND CÆSAREAN SECTION IN SAME PATIENT.

BY H. M. DOWLER, L.R.C.P. LOND., M.R.C.S.

THE following case of second Cæsarean section in the same patient presents several interesting points.

Patient, a Hindu woman, aged about 42, married about 25 years, was admitted to hospital on Dec. 20th, 1916, with false labour pains, soon cured by treatment; bronchitis. Present condition: The abdomen was very pendulous; parietes very thin. Marked osteomalaceon pelvis; outlet small, promontory prominent. Fœtus right occipito-posterior; obviously a child that could not be delivered by craniotomy. Kyphosis; no other mis-shapen bones. The calculated date of labour was Jan. 8th to 22nd, 1917. Urine dark; otherwise normal. Previous history: Rheumatic pain in lower limbs and back; has walked by the aid of a stick; duration five years. Two pregnancies during this time; unable to walk at all. She had had the following children: Living—3 girls of 18, 16, 13 years; 1 boy of 12 years; dead—1 boy at 9 months, 1 girl at 7 months, 2 girls stillborn, difficult labour. Also one girl was delivered by Cæsarean section 3½ years ago by Colonel C. Milne, I.M.S. The child lived for 2½ years, death being due to (?) infantile paralysis. There had been no miscarriages; no history of syphilis in any members of the family.

The bronchitis continued, being very troublesome on Jan. 7th. During the week before operation P. 110 to 130, T. to 99·4° F.

Operation.—Jan. 14th, 1917. The abdominal wall was stretched and very thin. The incision was placed as far as possible to avoid previous one. Owing to configuration of patient three-quarters of incision had to be above umbilicus, well clear and to left of mid-line. "Layers" could not be differentiated. The first spurt of blood came from adherent omentum. Omentum in various places had formed adhesions with the peritoneum; also to a dense extensive mass of adhesions between lower part of uterus and peritoneum of abdominal wall. These adhesions took a considerable time to clear. The uterine vertical incision was carried well upward to avoid site of divided dense adhesions as much as possible. During extraction the child (girl) passed meconium. Three loops of cord were round neck; these were clamped and divided. Placenta partially or completely detached before birth of child. The child was limp and rather blue; no respiration, but soon initiated by a few Schultze movements. After removal of placenta pituitrin and emetine intramuscularly. Right uterine appendages apparently had been removed at previous operation. Left uterine appendages matted together; adhesions of medium density. It was considered inadvisable to prolong an already lengthy operation in order to remove them. Anæsthetic: When about two-thirds through operation pulse had become decidedly weak. Respiration suddenly ceased; soon resumed normal rhythm by tongue traction. At conclusion of operation circulation good.

After history.—P. 118 to 120, R. 22 to 34, T. 99 to 101·4°. Catheter was passed six-hourly three times; afterwards urine passed naturally. Bowels acted two or three times with flatus daily, except on third day. No signs of lactation. Constant coughing very troublesome whole time after operation. On fifth day laparotomy wound apparently healthy; redressed. Seventh day: Coughing very troublesome. Sutures cut through in upper two-thirds of wound, intestine visible. Chloroform; edges pared, re-sutured. Ninth day: New sutures cutting through; removed. Gauze lightly packed under edges of incision. Fifteenth day: Well-formed adhesions, chiefly with omentum. At 9 P.M. P. 114, good character, R. 28, T. 100·2°. Sputum less viscid. Sixteenth day: Stated to have slept well until 4 A.M. and that pulse suddenly ceased an hour later. Resident found patient moribund; death soon after. Relations refused post mortem.

Remarks.—Bedsore formed over lower end of sacrum. Before admission ulcer (? bedsore) just below right anterior superior iliac spine. Skin easily cracked like an old kid glove while carrying out the ordinary process of cleaning. No physical signs of general peritonitis—no pseudo-ileus. No pain whatever, except muscular due to constant coughing, and latterly to the bedsore. Sputum: No. T. B. found.

Mussorie, India.

RUPTURE OF TUBO-UTERINE GESTATION: EXCISION OF SAC.

BY W. GIFFORD NASH, F.R.C.S. ENG.

THE following case of rupture of tubo-uterine gestation presents points of interest in regard to diagnosis and treatment.

Mrs. ——, aged 31, the mother of three children, whose last confinement in June, 1915, was normal and who was in perfect health, on August 29th, 1916, at 1 P.M., was suddenly seized with violent pain in the right lower abdomen and nearly fainted. At 3.30 P.M., when I saw her in bed, she looked rather pale, pulse 80, temperature 99° F. Her period was ten days overdue and as she had always been regular to the day she thought she was pregnant. On examination of the abdomen there was tenderness over the appendix. She had several times previously had pains in this region and feared she might get appendicitis. On vaginal examination there was nothing abnormal in the fornices, but manipulation of the uterus, which was a little enlarged, gave great pain.

At first I inclined to the idea that she had an attack of acute appendicitis, but as the examination was followed by a great increase of pain, which the patient described as being like labour pains, I remained with her for two hours. She gradually became more collapsed in appearance, but the pulse kept steady and fell to 72. She vomited once and complained of her stomach being full of wind. At 5.30 I came to the conclusion that she had a ruptured tubal gestation and gave her morphia to relieve pain during her removal to a nursing home seven miles distant. At 7 P.M. I saw her on arrival at the home and found the condition much the same, the pulse still being 72.

At 9 P.M. I opened the abdomen and a large quantity of blood and clots escaped. At the junction of the right Fallopian tube and uterus was a small swelling about the size of a hazel nut, with a small rent in it, from which blood was escaping. I excised the sac and sutured the wound in the uterine wall with chromic gut. I also removed the right Fallopian tube. When the patient was removed to bed the pulse was 120 and very weak. The abdomen remained distended for several days and vomiting continued for three days, Turpentine enemata gave relief and the bowels acted on the fifth day. The patient gradually gained strength, the pulse slowed down, and the anæmia disappeared. She returned home at the end of three weeks, had a normal period during the first week in October, and has since regained her health.

Although at first sight the diagnosis was rather doubtful, it soon became evident that one had to deal with a much more serious condition than an acute appendicitis. Manipulation of the uterus caused a great increase of pain and collapse, no doubt owing to a recurrence of hæmorrhage. Bland-Sutton says that in tubo-uterine pregnancy rupture may be delayed longer than in purely tubal gestation, and may occur even as late as the sixteenth week, but sometimes the sac bursts very early, and in such cases death takes place within a few hours from hæmorrhage. In the case recorded rupture took place at about five weeks. The operation of excision of the sac was evidently the right one, as the shock was less than if hysterectomy had been performed and the patient was left with a uterus capable of bearing children. The slow pulse was rather puzzling and appeared to be due to some nervous inhibition which was removed by the anæsthetic.

Bedford.

Reviews and Notices of Books.

The Growth of Medicine from the Earliest Times to About 1800. By ALBERT H. BUCK, M.D. London: Humphrey Milford, Oxford University Press. Newhaven: Yale University Press. 1917. Pp. 582. Illustrated. Price 21*s.*, or $5 net.

THE appearance of Dr. Buck's volume shows that the history of medicine is being pursued as vigorously in the United States as it is in England. The growth of this study in itself forms an interesting chapter which still remains to be written. The Elizabethan surgeons dealt with it incidentally, but they had neither the necessary education for any original work nor the desire to use it save as a means to the end in view—that of exterminating quackery. In the next great literary awakening in England the physicians treated it more seriously, and Freind wrote his history of physic to wile away the hours of his imprisonment in the Tower. From his time onwards constant additions have been made by various authors. Clifton and Aikin, Wadd and Pettigrew, *quasi cursores*, handed on the lamp, with a flame now flickering, now burning brightly, to Greenhill and Payne, Osler and Norman Moore, Edward Withington, and Dr. and Mrs. Charles Singer. The disciples were often a mere handful, but they formed the cream of the profession in the versatility of their talents.

The present volume is the first work issued by the Yale University Press at the expense of the Williams Memorial Fund—a trust established to enable the Yale University Press to accept for publication medical and scientific treatises which, for sound business reasons, cannot be considered from a merely commercial standpoint. Dr. Buck has divided his work into three divisions dealing respectively with ancient medicine, mediæval medicine, and medicine during the Renaissance. It may be said at once that the first two sections are better than the third, where he has allowed himself to be overweighted by the wealth of his material. The book is written throughout to popularise the history of medicine by giving readers an account of the way along which medicine has travelled until it has reached its present position. Very little attempt is made to go to original sources for the information supplied, but reliance has been placed upon the works of Daniel Le Clerc, Friedlaender, Daremburg, Haeser, Von Gurlt, Pagel, and Max Neuburger. Less than justice, therefore, has sometimes been done to English medicine, and mistakes are made which might have been avoided by consulting the "Dictionary of National Biography" and such other histories and monographs as are easily accessible in any public library. The general result, however, is excellent, and the author is to be congratulated whole-heartedly upon the successful manner in which he has treated the dreary subject of sects in medicine, for he explains briefly, but clearly, the tenets of the Methodists and the Pneumatists, the Dogmatists, the Empirics, and the Eclectics, which exercised such a baneful influence upon the progress of medicine during many centuries. He has even succeeded in giving some shadowy body to the ghostly figures of Roger and Roland, though he makes no attempt to identify the "four masters" upon whom they commented. In connexion with the Regimen Sanitatis Salernitanum, Dr. Buck states that Sir Alexander Croke produced an English version of the poem. This is wrong, for Croke only reprinted a translation issued in 1607. In giving an example of the poem Dr. Buck quotes one of the interpolated lines and then translates it incorrectly.

The adhesion to the works of general historians of medicine has led Dr. Buck into some omissions and inconsistencies. Thus, in treating of Babylonian medicine there is no mention of Professor Jastrow's work, and in like manner Iwan Bloch's conclusions about the origin of syphilis, with the valuable evidence upon which they are based, is wholly ignored, nor is there any mention of Professor Van Leersum's scholarly edition of Jan Yperman. Surely, too, Robert Grosstête and Adam Marsh are worthy of more recognition than the bald statement that they were "two men whom Neuburger describes as theologians of a very liberal type." A fig for Neuburger and his opinion of them! Reference is made to the edition of John of Ardern issued by the Early English Text Society, but nearly all the statements about him are incorrect and are there refuted. No hint is given of the progress of surgery in England as apart from barber surgeons, nor is there any account of the barber surgeons themselves. These are blemishes which can be remedied in the second edition, which will certainly be called for, and in which the first two parts should be left standing and the third rewritten. The illustrations are well rendered, and are taken for the most part from the works of Dr. Meyer-Steineg, Dr. Hollaender, and Dr. Nicaise. There is a moderately good index. The paper, printing, and format are excellent, and reflect credit on the Yale University Press.

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(1) *An Introduction to Special School Work.* By M. F. BRIDIE. London: Edward Arnold. 1917. Pp. 238. Price 3*s.* 6*d.* net.

(2) *Physical Education in Relation to School Life.* By R. E. ROPER, M.A., M.Ed. London: George Allen and Unwin. Pp. 116. Price 2*s.* 6*d.* net.

1. THIS little book, written by a teacher for teachers, will be welcomed by many. Though primarily intended for those who are undertaking work in special schools under education authorities, it contains just those details which will be helpful to those conducting institutions for the feeble-minded or private schools for backward children, and will be of value to any practitioners who may have to advise on the upbringing of such children. Besides this more direct aim, the sections dealing with the mentally younger children will apply with almost equal force to the problems of commencing education, whether in the nursery, school, or the home.

The author lays just stress on the importance first of all of understanding the emotional activities of each child, so that social sentiments and true volition may be built on the basis of primitive instinctive impulses. In the defective, physical strength is usually greater than the mental powers of control, hence steady discipline is wanted to train the child for the future, and this discipline needs to be continuous and not merely exercised in school while the child may run wild in the streets or home. Inertia must not be mistaken for goodness; the quiet, lifeless little person, though often praised for goodness in sitting still, is often more deeply defective than the boisterous child constantly in trouble. Negative suggestion is responsible for much trouble; positive suggestion by example and precept is the only way to secure good results. Motor and sense training, so adapted as to take advantage of the natural interests of the child, is one of the first steps, and many ways of so doing are set out in ample detail. Reading and number work come later. The value of learning by word-wholes, so that each symbol shall have a concrete meaning, is demonstrated, but it is pointed out that in placing the name beneath an object or a picture simple words must be used, and they must be printed in the type in ordinary use. Thus, "The horse" beneath a picture of the animal teaches a lesson that may entirely fail if printed as "THE HORSE." Full details are given on the progressive development of training in number, while the sections on manual instruction and vocational training will be read with interest by many beside the special school teacher. Many practitioners must have found difficulty in advising on occupations offering any prospect of a useful life, so that the details of trades which can be adopted with success will be most helpful. The aim in this connexion is to make suggestions which will on the one hand strengthen the moral character of the child by increasing his self-respect, showing him certain things he can do which perhaps his brother or sister in an ordinary school has not learnt, and on the other to make him self-supporting. Special attention is devoted to vocational training for girls on a broad basis so as to avoid the risk of distaste for work being acquired before she leaves school. While it is important to encourage each to do the best of which she is capable, it is unjust to keep a girl at some dull menial task until she can do it without attention, lest she learn to consider herself incapable of anything better. The secret of success is said to be to let the children do their own learning, the teacher's part being to induce and sustain interest and effort. For this ideals must be encouraged which can only be secured with happy children: "happiness first—all else follows" is the key-note of a most welcome volume of educational practice.

2. In "Physical Education in Relation to School Life" the problems of health and education are viewed from the standpoint of the results of the habitual attitudes of school life. The effects of constant sitting on the limbs, the abdomen, and the chest are analysed, the author emphasising the point that the effects of antero-posterior curvature of the spine, though less noticed, may be as serious as those of lateral curvature. In particular he insists on the sedentary position being responsible for diminution of the antero-posterior diameter of the chest, a lessened respiratory excursion, and the substitution of abdominal for upper costal breathing. He studies postures by means of silhouette outlines taken by the shadow thrown from an arc lamp on to a paper screen, directions being given for the proper distances of the paper and the mid-plane of the body to secure satisfactory results. The outlines, which can be taken of any posture with or without clothing, serve to impress the details both on the observer and the subject. He discusses the amount and nature of the daily exercise required to combat the malpostures, and favours the provision of gymnastic apparatus in all schools. But a gymnastic teacher must have been trained in general educational methods as well as in the special subject of physical training with its associated physiology and hygiene. The value of gymnastic exercises depends, not on an increase in the power of attention, but of the development of isolation and coördination of muscular action with increased power of inhibition and economy of movement. The points are explained in general terms for the use of public authorities, but with such comments in detail as will be of interest to those practising orthopædics or general medicine. The author considers that suitable training in physical education reacts on the mental life, holding that the clumsy, rowdy, uncouth mass in the middle school, which hinders progress in most schools, is the result far more of school environment than of any stage of puberty or growth, and that no such unsatisfactory period of mental or physical development is at all necessary.

LIBRARY TABLE.

1. *The Old Huntsman and Other Poems.* By SIEGFRIED SASSOON. London: William Heinemann. 1917. Pp. 109. 5*s.* net.—2. *Windows.* By CHRISTOPHER JOHNSON and E. B. C. JONES. Oxford: B. H. Blackwell. 1917. Pp. 32. 1*s.* net.—We have before now referred to the remarkable popularity among the literary youth of to-day of the metrical form for the expression of their thoughts. In the course of the last few weeks we have received several volumes of poetry, from which we have selected two for notice. Of these Mr. Sassoon's is far the more important volume—to our thinking his collection makes quite a notable achievement. He is obvious in places, imitative in places, and trivial sometimes, but he preserves the true demeanour of the poet, for he thinks subtly, and compels his pen to convey to his readers both his broader messages and his vaguer hints. He belongs to the school which is slangy, ribald, and occasionally blasphemous, and he would probably be amusedly contemptuous if he were told that his verse sometimes gains nothing in vigour or vividness from the two latter of these qualities. But his nature pictures are quite beautiful, and his eye for a situation is that of the true dramaturge. "The Old Hunter," the longest piece, is real poetry, as well as a sound psychological study, and the following, divested of its pictorial qualities, is a note that might appear in many surgical case-books describing the sequel of a smashed leg:—

THE ONE-LEGGED MAN.

Propped on a stick he viewed the August weald;
Squat orchard trees and oasts with painted cowls;
A homely, tangled hedge, a corn-stooked field,
With sound of barking dogs and farmyard fowls.

And he'd come home again to find it more
Desirable than ever it was before.
How right it seemed that he should reach the span
Of comfortable years allowed to man!
Splendid to eat and sleep and choose a wife,
Safe with his wound, a citizen of life.
He hobbled blithely through the garden gate,
And thought: "Thank God they had to amputate!"

"Windows" is a very little book, although it has taken two authors to make it. The probability is that it is the result of a close selection from numerous manuscripts of varying standards of accomplishment. Both authors are distinctly sad and both violate ordinary rules of inflection with what must be deliberation and not lack of ear. Both authors are well read in modern poetry as well as clever, and we trust that neither will think us offensive if we say that they appear conscious of their cleverness. Mr. Christopher Johnson's "Apotropos" is delightful and he has an uncanny appreciation of fantastic cloudscapes. The best original poem of E. B. C. Jones—we decline to guess at genders—deserves quotation:—

JERKED HEARTSTRINGS IN TOWN.

I have heard echoes and seen visions of you
Often of late. Once, yawning at a play
A sad, keen rapture suddenly pierced me through
Because one puppet moved and sighed your way;

An omnibus conductor fixed your glance
—Intense, preoccupied upon my fare;
I saw your stooping shoulders, at a dance,
Lean by a doorway,—but you were not there;

Down Oxford-street, in the slow shopping crowd,
Hearing your very voice: "Ah, that's superb!"
I turned—a tawdry, simpering little dowd
Passed by, and left me trembling on the kerb.

New Inventions.

A "NEEDLE WING GRIP" FOR INTRAMUSCULAR INJECTIONS.

IN giving intramuscular injections of mercury and neo-salvarsan, &c., it is a wise practice after plunging the needle into the muscle to detach the syringe from the needle and see that there is no bleeding. If blood comes from the needle it means a blood-vessel has been punctured, and so the needle should be removed and the operation repeated. Working with an all-glass syringe and an irido-platinum needle it is not always easy to detach the syringe from the needle partly owing to the short space between the shoulder of the syringe and the skin, and partly from the difficulty of getting a firm grip of the rounded mount of the needle. As a result the slender glass nozzle of the syringe is frequently broken off. To overcome this difficulty I devised the following simple needle grip. It is composed of two little side-wings (A and B) of copper, soldered to the needle-mount and extending for a short distance up the sides of the barrel of the syringe. The desired dose of mercury or of neo-salvarsan is drawn into the syringe; the needle is then attached to the syringe and plunged into the muscle. To detach the syringe the wings of the needle are held between the index finger and thumb of the left hand; then the syringe can be easily detached by slightly rotating it with the right hand. If there is no bleeding the syringe is re-fixed into the needle and the piston driven home.

FIG. 1.

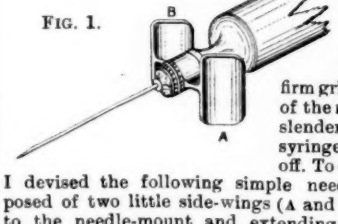
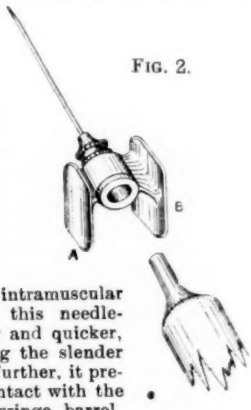


FIG. 2.



When a large number of intramuscular injections have to be given this needle-grip makes the operation easier and quicker, and lessens the risk of breaking the slender glass nozzle of the syringe. Further, it prevents the fingers coming in contact with the previously sterilised skin or syringe barrel.

The needle attachment here illustrated was made for me by Sergeant G. T. Platford, R.A.M.C., from a small piece of copper, and was soldered to an ordinary intramuscular irido-platinum needle; but it should be possible to make a detachable grip which would be adaptable to any needle.

CHARLES F. WHITE,
Major, R.A.M.C.
General Hospital, B.E.F.

Dr. J. Reidy, a member of the Stepney borough council, has been appointed to the Commission of the Peace for the County of London.

THE LANCET.

LONDON: SATURDAY, JULY 28, 1917.

The Fourth Year.

No one knows better than the medical man the effect of repeated anxiety; no one is more familiar than the pathologist with the general disturbance of the organism that may follow the recurrence of some quite unimportant noxa which gains by its damnable iteration an artificial force. The prolongation of the war, with its perpetual struggles and griefs, must produce in all the belligerent nations a frame of mind that is readily susceptible of small shocks, over and over again inflicted; and it is in this way, of course, that the Germans desire to profit by aerial warfare on our home coasts. Aware that the local damage is small to population and property after such air-raiding, even if the opportunity of penetration as far as some thickly populated centre like London should occur, they hope to interfere with our morale, and so to suggest an abatement of the relentlessness with which our part of the fighting is now being conducted, by the creation of perpetual apprehension. They wish to "rattle" us, and it is good to know that the intention has entirely failed. The Prime Minister has the qualities of a sound physician in taking an early opportunity of pointing out that the general condition of things in the country is such that it would be idiotic, as well as a direct justification of German psychological acumen, to allow the inevitable and repeated irritations caused by air-raids to interfere with our phlegm. Speaking on Belgian Day in response to the new German Chancellor's conditional peace offers, he naturally insisted that the deliverance of Belgium must be complete, and that the German idea of the freedom of Belgium bore no kind of relation to any freedom. And the corollary of his speech is that the efforts of the Allies, though some may be hampered terribly in bringing their strength to the common cause, must be unrelaxing. We must not be "rattled," he said, but he said more, for he showed almost gaily, though so seriously, that confidence in the issue was sound. It would be a good thing if the full medical side of the horrors which the Belgians have suffered and are suffering were better known in this country, for it is impossible not to see, with this knowledge present to us, what superlative sacrifice the Belgians have made in the cause alike of their own freedom and of what they considered their honourable duty towards those countries who were pledged to protect them, but whose pledges were rendered temporarily void by the treachery of the Germans in repudiating their engagements. From the reports of the Belgian Doctors' and Pharmacists' Relief Committee we have learned the terrible things which not only the medical men but all classes of the community have undergone in their enslaved land. They have endured semi-starvation and official brutality of an unmentionable sort. Their courage remains unimpaired as an example to us all. We must show that the lesson in fortitude has been thoroughly learnt by us; our French brethren show this day by day.

The fourth year of war will be upon us before the next issue of this paper, and it is inevitable that the profession of medicine should look back on what medicine has accomplished, and take some stock of how far our organisation has succeeded or failed in the past, and in what directions things are being better ordered for the future. This can be done with mingled pain and pleasure—mistakes have been made, but they have been and are being remedied. The outbreak of war found the medical profession, in common with every section of the population, military or civil, unprepared for a struggle of such magnitude or duration, but with the advantage over all other civilians that the doctor, as he stood, was of superlative value as a trained man for medical needs, whether with or without a uniform. As a result an immediate draft was made upon our body of such magnitude and such quality that when a vast British army began to take shape, and the operations of war assumed something their present magnitude, the supply of medical men available was already much depleted. Those who had the conduct of the war in their direct charge were lacking in imagination and foresight. An ominous state of affairs was met by the medical profession itself with the institution of the Central Medical War Committee and other bodies, which later were empowered by the State to deal with the need of medical service by the Navy and Army on the one hand and by the civilian population on the other. The Scottish Medical Service Emergency Committee entered with zeal and discrimination into the task of recruiting the officers for medical military purposes, while satisfying civilian needs by various methods of professional arrangement. In England and Wales the situation was more arduous, owing primarily to the magnitude of the populations concerned; but assisted by the Committee of Reference of the English Royal Colleges, the Central Medical War Committee has been able to differentiate impartially between the needs of the fighting forces and those of the civilian population, a population which includes vast bodies of workers whose industry is directed entirely towards the manufacture of munitions of war. The work of the three statutory committees has been continuous and hard, and the claim can be made with confidence that no section of the community has deserved better of the country than the medical profession during the war; for as civilians they have organised themselves for military purposes, though the conditions of their employment were often hard to defend.

The demands of the War Office for medical officers have been for the last 18 months very urgent, and on this the question has followed whether an economical use is made of the material supplied. That question has never been answered satisfactorily, and possibly never can be, but of late a more definite intention has been manifested by the military authorities to give the views of the civilian medical

men full attention. It is good hearing also that the control of the medical examination of recruits will be placed in civilian hands, and we urge that the constitution of the boards should be committed to proper professional authority, such as can and would be exercised by the Statutory Medical Committees. We referred last week to the probability that such a move would be made, and the reform is a direct recognition of the fact that the medical profession, for purposes of war, as for purposes of peace, is one. The services must be supplied with fit men; the soldier and sailor in their paramount needs must be cared for; and their wives and children, as well as the workers who supply their militant wants, must be maintained in health. All classes of medical men can work together towards these ends, and the message of the time seems to us to be that intelligent co-operation is arriving. But it is arriving in the fourth year of the war.

Industrial Fatigue and Industrial Unrest.

PRACTICALLY simultaneously there have been published the Report of the Commission of Inquiry into Labour Unrest, Professor STANLEY KENT'S address on Fatigue and Alcohol (which appears in another part of our present issue), and the Eighteenth Memorandum of the Health of Munition Workers Committee by Dr. H. M. VERNON. These three pronouncements, when taken togther, are weighty contributions to the problems set by that industrial unrest, the signs of which at the present moment are writ on the wall in clear and unmistakable characters.

The report of the Commission appears to us unsatisfactory. The influences which for the moment are irritating the men—even restrictions on liquor are called in—are given in detail as ascertained; but the condition of the men which causes them to find these influences so irritating is hardly touched upon. Unless this condition is dealt with attention to these details seems to us like a fire-brigade turning attention to the gas jet which started a conflagration instead of rendering the surrounding buildings less inflammable. Professor KENT has gone among the industrial workers and observed them with a scientific eye, and what he says on the causation of industrial drinking is equally applicable to industrial unrest. We quote his important words:—

"It is labour performed under factory conditions, for too long hours, by workers already tired and often under-fed, whose health is undermined by unhygienic surroundings, whose aspirations and ambitions have been killed, and who often have become mere machines. The worker is not, as a rule, communicative, except to his fellows. ..... Only those who have spent long periods in close association with him and have studied his home life as well as his daily round in the factory have any idea of what his existence really is. Hence, as a rule, his attitude is entirely misunderstood. It is easy for those who are living, it may be, strenuous lives themselves, but who at all events enjoy comparative comfort at home, to decide that the patriotic worker can well afford to give up his Bank Holiday in order to increase output. They will probably be surprised to hear of cases where the daily round of the worker commences at 4 o'clock in the morning and ends at 10 o'clock at night, and where the poor six hours left for 'home life' are passed in surroundings so squalid as to make a stable, with clean straw, preferable. They do not realise the feeling of utter helplessness which industrial fatigue in its severer phases really means. No one who has not experienced it can understand it: neither can they understand the gallantry of those who struggle against it day after day, week after week, with nothing to look forward to but an occasional 'Bank Holiday,' and with a great probability that even that may be cancelled."

This picture is not overdrawn, and we agree with Professor KENT that it is on conditions that the first attack must be made. The conditions under which so much industry is carried on are the cause of the unrest.

When will social reformers call in the physiologist to their aid? He who would understand why men do this or that must study first the men themselves, not the apparent reasons which cause them to act in this or that way. The over-worked and tired man, however self-respecting a craftsman he may be, who depends on carried food for his nourishment day after day and month after month, who has no facilities even for washing before leaving work, who is expected to be at the factory without time for a meal at 6 A.M. and to be there 12 hours or more, who has to work these hours in places constructed for housing machines, not men, who sleeps in an overcrowded room, and who has no opportunity given him, even if he has time to use it, of healthy recreation, such a man must become irritable, and is the ready material for any agitator to set alight whatever be his special gospel. Such men find that alcohol soothes their jaded feelings and will resent its curtailment; but to say that curtailment of alcohol causes the industrial unrest, causes these jaded feelings, is a sorry and superficial view of the problem. Need it here be observed that no physiologist or medical expert was asked to assist the Commissioners. Industrial fatigue causes industrial alcoholism, says Professor KENT, although for the printing trade at least we believe his description to be overstated for present conditions. Industrial alcoholism causes industrial unrest. Remedy one and the other disappears, the scientific problem being solved by an appeal to cause. We firmly believe that fatigue determines unrest, just as conditions determine fatigue.

The proposition being accepted that industrial fatigue and industrial unrest are related as cause and effect, the obvious thing to do is, if possible, to lessen industrial fatigue. Much, of course, could be done, if time allowed and the position were not pressing, to improve housing conditions, construct more canteens, improve factory conditions, provide washing facilities, organise healthy recreation—to create, in short, "the elements of a healthy, full, and interesting life, in place of a mere existence, without pleasure, and without hope"; such things, however, cannot be done in a day. But the hours of labour can be shortened, and those spent in work can be so distributed that work need not commence before breakfast is taken. The result of such shortening hours has been shown by Dr. VERNON not to be inimical to output: when the actual hours of work of a group of women were reduced by 20 per week, from 66·2 hours to 45·6 hours, the gross output went up 9 per cent.; when the actual hours of a group of men were reduced from 58·2 to 51·2 their gross output

increased 21 per cent.; and when some lads on light work were employed 54·5 hours instead of 72·5 their gross output only fell off 3 per cent. These results are in complete harmony with the very interesting experience, so long ago as 1900, of the effect of reducing the working day from nine to eight hours at the Zeiss optical works in Jena, described by Professor H. J. SPOONER in a recent pamphlet.[1] Dr. VERNON'S present memorandum is only a continuation of the work published in the Interim Report of the Health of Munition Workers Committee; and we cannot help feeling that the Commissioners on Industrial Unrest did not familiarise themselves with the literature of their subject as set forth by this expert committee. If shortening and rearranging hours, which does not require structural alterations, leads to increase of output and reduces fatigue, why is it not done? The question is not new; and now hard facts and details are presented. Dr. VERNON shows that limitation of output cannot be claimed to explain away his findings; he shows how the right adjustment of hours can be determined; and he shows how the output to be expected from reduced hours can be calculated. The remedy for much ill has already been found.

Annotations.

"Ne quid nimis."

JAMES PEDDIE STEELE.

THE sudden death is announced at his villa in Florence of Dr. James Peddie Steele at the age of 81 years. Dr. Steele, who was for a long time our special correspondent in Rome and later in Florence, had been a member of the staff of THE LANCET for 50 years, and was a regular contributor to our columns until the time of his death. The son of the rector of Dalkeith Grammar School, he was a distinguished graduate of the University of Edinburgh, and was well known as a scholar in that city before he came to London, partly as a physician and partly as a journalist. In the latter capacity he made an immediate mark. He was a sound classic, and in particular a famous Latinist, while he had a wide range of knowledge in history, art, and the developments of his own profession. His leading articles appeared in some of the best known lay journals as well as in THE LANCET, and in the former channels his contributions could generally be detected alike by their old-fashioned and successful use of the Latin period, and by the advanced spirit of medical research which was always displayed in them. It is now some 40 years since Dr. Steele, who was connected with several Italian families, went to Rome as a physician, and in that city he was known to many British scholars and medical men for his unfailing courtesy and hospitality to all visitors. On retiring from practice in Rome he went to live in Florence, where again his house in the Via Pico della Mirandola, and later his villa on the Mugnone, became the centres of his open-handed hospitality. He was the personal friend of many leaders of Italian scientific and social thought, a benefactor of the British Archæological School, and a beneficent supporter of many religious and educational movements, both in Italy and at home. He was a learned, kind, witty, and modest man, and throughout his life all his thoughts and actions were supported in the most practical manner by his devotion to the doctrines of the Established Church.

[1] Industrial Fatigue in its Relation to Maximum Output. Co-partnership Publishers, Ltd., 6, Bloomsbury-square, W.C. 1. Price 6d. net

PROPHYLACTIC INOCULATION AGAINST BACILLARY DYSENTERY.

THE undoubted success of prophylactic inoculation against infection by bacteria of the typhoid-paratyphoid group has led to trial of similar methods of protection during epidemics of other bacterial infections. One of the recognised scourges of armies in the field is the group of diseases which have been designated since the time of Hippocrates by the term "dysentery." Comparatively recent research has shown that in truth dysentery comprises a series of infections of the intestinal tract by pathogenic bacteria and protozoa. The bacilli of Shiga and of Flexner are now universally recognised as causative agents of dysentery. Evidence has been brought forward during the present war to show that other bacteria, formerly associated with disturbances of the intestinal tract such as summer diarrhœa, may be the causative agent of epidemics of what are clinically cases of dysentery. Further observations on this point are very desirable, for protective inoculation against a *group* of diseases (which dysentery really is) cannot prove wholly effective unless the body is protected against invasion by all the bacteria which may cause the diseases. For the time being, however, and in the light of our present knowledge, we may reasonably hope to be able to protect against infection due to the two well-recognised causes of bacillary dysentery by the employment of an efficient mixed vaccine of the dysentery bacilli of Shiga and Flexner. Until recently the employment of such vaccines was impossible owing to the severe reaction produced by their inoculation. Various methods have been tried with a view to diminishing this reaction, but none of them have proved sufficiently reliable to warrant the wholesale inoculation of troops or sections of the community. An article by Captain H. Graeme Gibson, R.A.M.C., in the June number of the *Journal of the Royal Army Medical Corps*, deals at length with this very important subject. The author has been at pains to test the efficacy of various advocated methods, and has sought to perfect a method of his own. The method suggested by Professor H. R. Dean, in a report to the Medical Research Committee, of neutralising the toxins by means of eusol was shown to have inconvenient limitations in practice, for the vaccine so prepared became toxic on keeping, no doubt due to the breaking down of the bacilli. Sensitised vaccines and the method of administering the vaccine in conjunction with anti-dysenteric serum, as recommended by the Tokio Institute in Japan, also proved disappointing, not by reason of the reactions produced, but rather because of defective power to stimulate the elaboration of protective substances. Captain Gibson conceived the idea that this drawback was due to the bacteria being rendered inert as antigens by the antibacterial substances of the sera employed. To overcome the difficulty he absorbed these substances from the serum, and after having satisfied himself that the removal of the antibacterial substances from the serum did not interfere with its

antitoxic action he administered the vaccine with this absorbed serum. Inoculations into rabbits and later into himself showed that the vaccines so treated led to very little reaction, either local or general, and laboratory tests demonstrated that the inoculations led to the development of protective substances in the blood. A number of men were then inoculated at Aldershot and it was found that the serum-treated vaccine prepared by Captain Gibson's method did not produce excessive reactions. The protective inoculation against bacillary dysentery may be said to have been rendered practical by these researches, and the results of trial in the field, which is now taking place, will be awaited with interest. Captain Gibson, as well as Lieutenant-Colonel D. Harvey, C.M.G., officer in charge of the vaccine department, are to be congratulated on the fruits of their labours, more especially as the work has been conducted during a time of stress, for the supply of typhoid and paratyphoid vaccines for our armies has been in the hands of these officers of the Royal Army Medical Corps.

THE BIOLOGY OF WATERWORKS.[1]

THE seventh of a series of highly useful pamphlets dealing with economic subjects from the scientific point of view issued by the British Museum authorities deals with the biology of waterworks. The importance of the subject can hardly be over-estimated, as it involves questions of taste, smell, and physical appearance of water, mechanical blocking of pipe-lines, sand-filters and screens, and generally the purity and safety of potable water. Mr. Kirkpatrick is to be sincerely congratulated on the able and lucid manner in which he has dealt with the important problems which confront water-engineers, chemists, bacteriologists, and biologists. The author uses the word disinfection as synonymous with sterilisation. This may be perfectly correct, but is perhaps unfortunate in relation to water-supply, as the public are apt to associate disinfectants with cesspools, drains, and generally noxious matters. Under Section 1, "Animals that may be Associated with Water-supply," the author gives a most fascinating account of the pipe-fauna found at Hamburg. Before filtration of the river water, protozoa, sponges, hydrozoa, worms, mollusca, polyzoa, crustacea, eels, &c., were freely found. When sand filtration was introduced in 1894 the whole pipe-population died of starvation due to the cutting off of the food-supply of organic particles (diatoms, débris, &c.) carried in with the current. Not less interesting is the section devoted to "Plants that may be Associated with Water-supply." Such growths as tabellaria, fragilaria, synedra, cyclotella, asterionella, spirogyra, hydrodictyon, chara, anabæna, oscillaria, crenothrix are dealt with and a number of illustrations are given. These might, with advantage, have been more numerous and drawings are usually of less value than photographs. The last section deals with "Biology in Relation to Water Purification," and questions relating to sand filtration, storage, and sterilisation are concisely considered. No thoughtful person could possibly read this pamphlet without coming to the inevitable conclusion that many of the errors of the past in waterworks procedure have been due to lack of biological knowledge.

[1] The Biology of Waterworks, by R. Kirkpatrick, Assistant in the Department of Zoology. Printed by order of the Trustees of the British Museum. 1917. Price 1s.

FRESH LIGHT ON THE TREATMENT OF TETANUS.

THE third edition of the Memorandum on Tetanus drawn up by the War Office Committee contains the fruits of the experience of nearly a year since the memorandum was first issued. A distinction is now drawn between the directions made for preventive treatment and those concerning curative measures. The former are to be regarded in the light of an Army Order to be carried out, like small-pox or antityphoid inoculation, "whatever may be the personal predilections of the medical officers in charge of hospitals." The curative measures, on the other hand, are suggestions to the medical officer. Repetition of the prophylactic dose is now insisted on; all wounded men, among whom cases of trench-feet are included, are to receive at least four injections of antitetanic serum at intervals of a week. Emphasis is laid on the necessity of giving a prophylactic dose when any operation is performed at the site of wounds, even when these are already healed; this dose is best given 48 hours before operation. The primary importance of early diagnosis receives extended treatment. All clinical and experimental evidence, the memorandum runs, tends to show that the chances of successful treatment diminish rapidly as the length of time increases after the first symptoms have been observed; and nursing sisters are warned to give the alarm whenever muscles around a wound are felt to be harder or more rigid than those of the uninjured side. In regard to curative measures the most important factor is the size of the dose, the object being to saturate the body with antitoxin as quickly as possible and to maintain this saturation. For this purpose the memorandum suggests the injection of 50,000 to 100,000 units of serum during the first few days of treatment. The intrathecal route is the one recommended, combined, if thought desirable, with intramuscular injections. The memorandum is a useful summary of the present state of expert opinion on a very pressing topic; the frequent revision to which it has been subjected in the light of experience is a most encouraging feature and inspires confidence in the results shown.

PHYSICAL ORTHOPÆDICS.

TWO addresses recently delivered at provincial centres have emphasised the value of physical methods in the treatment of the injuries of war, and bear witness to the increasing popularisation of these methods. Dr. William Gordon, on the occasion of the opening at the Sidmouth Baths of a hospital for officers with stiffened joints, spoke of the widening which is taking place in the ancient formula "massage and electricity." Preparatory heat in various forms is now playing a very large part in rendering supple the joint which is to be moved, and in the precise application of such heat, as well as the accurate measurements of the degree of disability before and after its application, Dr. Gordon finds the chief evidence of recent progress. At the opening of the orthopædic department of King Edward VII.'s Hospital at Cardiff, Dr. R. Fortescue Fox dwelt on the new and vast application of the old term orthopædics to cover the disabilities and deformities induced by war. The tendency of medical progress is to bring physical remedies into more general use and esteem, but unfortunately their employment still remains, to a large extent, empirical. Remedial exercises and

mechanical treatment are becoming widely recognised as possessing educational and medical value, but are not satisfactorily applied in practice, as their effects upon the body have been little studied, in this country at any rate. In the new department at Cardiff Dr. Fox saw an opportunity for the special instruction and research which was necessary for the credit of the practitioner and the interest of the public. The cognate subject of the importance of physical exercises for the production and maintenance of national health and efficiency was dealt with by Major Sir William Milligan in a lecture at the Royal Institute of Public Health. Our system of education does not sufficiently recognise the interdependence of mental development and bodily fitness; and physical training, we agree with Sir William Milligan, should be an integral part of our undergraduates' curriculum, as indeed it is in the American universities. The physical training in our public elementary schools is good so far as it goes, but unfortunately ceases too early in the child's life. Sir William Milligan advocated the establishment of a central anthropometric bureau for the recording of the height, weight, and muscular development of the youth of the country, with a view to obtaining an accurate criterion of the physical degeneration or otherwise of the population.

THE OXFORD OPHTHALMOLOGICAL CONGRESS.

THE Oxford Ophthalmological Congress held its eighth annual meeting at Oxford on July 12th and 13th. Members assembled at Keble College on the evening of the 11th, where, as in former years, accommodation had been kindly provided by the college authorities. Proceedings took place in the Department of Human Anatomy in the University Museum by the courtesy of Professor Arthur Thomson, to whom the Congress once again is greatly indebted. The meeting, which was well attended, was opened with a short address of welcome by the Master, Mr. Sydney Stephenson. The subject for discussion was "The Correction of Errors of Refraction," the openers being Lieutenant-Colonel Robert H. Elliot and Mr. Ernest Clarke, both of London. Dr. George M. Gould (Atlantic City, N.J., U.S.A.), who had accepted the invitation of the Council to open the discussion, was unavoidably prevented from attending, but his manuscript was read. The following members took part: Sir Anderson Critchett (London), Mr. J. Gray Clegg (Manchester), Mr. T. Harrison Butler (Leamington Spa), Captain R. J. Coulter (Newport, Mon.), Dr. F. W. Edridge-Green (London), Miss Marion Gilchrist (Glasgow), Dr. D. V. Giri (Southampton), Dr. T. Eustace Harwood (London), Mr. John Hern (Darlington), Dr. George Young (Colchester), Mr. H. M. Traquair (Edinburgh), and Mr. Johnson Taylor (Norwich). The morning of the second day was devoted to papers and demonstrations. Proceedings opened at 10 A.M. with a paper by Dr. Edridge-Green on the Relationship of the Theory of Vision to Ophthalmology, which was discussed by Lieutenant-Colonel Elliot, Mr. Harrison Butler, Dr. Stewart Barrie, Mr. Traquair, and Mr. Hern. Dr. Young gave an interesting demonstration of his method of testing the colour threshold and its diagnostic value, and Mr. W. W. Sinclair described his experiences with the test, with especial reference to renal retinitis. Lieutenant-Colonel Elliot showed lantern-slides illustrating the direction in which the cataract may be dislocated by the coucher during the Indian operation of couching. Dr. Giri read a paper on Ring Infiltration of the Cornea in a case of Purpura, with some general observations on the different forms of Corneal Infiltration, and Captain Adams contributed "Some Points on Retro-Bulbar Neuritis, with Especial Reference to Prognosis." In the afternoon some extremely interesting cases, which were afterwards fully discussed by the meeting, were shown at the Eye Hospital by Captain Adams. Dr. Giri and Mr. Bernard Cridland also showed cases. Mr. Johnson Taylor read a paper, entitled "Jottings on Local Anæsthesia and Other Points in Ophthalmic Surgery," and Captain Coulter reported a case of Bilateral Interstitial Keratitis following injury to one eye, with especial reference to its medico-legal aspect. At the close of the discussion on Thursday Professor Sir William and Lady Osler entertained the members and their friends to tea at 13, Norham-gardens, and the official dinner was held on the same evening in the hall of Keble College. The Vice-Chancellor of the University, the Very Rev. T. B. Strong, D.D., Dean of Christ Church, was in the chair, and there were also present the Rev. W. Lock, D.D. (Warden of Keble College), Professor Sir William Osler, Professor Thomson, Surgeon-General Sir Frederick Bradshaw, K.C.B., the Rev. F. Cronshaw, Major Turrell, and Captain Sankey, besides the officers and members of the Congress and their friends.

A NEW MEDIUM FOR SKIN-GRAFTING.

LARGE superficial wounds are such a common feature of warfare, and their healing by ingrowth of epithelium from the edge so tedious, that the neglect of skin-grafting is not a little curious. Captain S. R. Douglas, Captain L. Colebrook, and Mr. A. Fleming inquired into the causes of this neglect in their important study of skin-grafting which we published on July 7th, and they came to the conclusion that the neglect was due partly to the very variable success of the methods of Reverdin and Thiersch as commonly employed, and partly to the surgeon's wish to spare the patient the trouble and discomfort of a general anæsthetic. Captain Douglas and his co-workers at St. Mary's Hospital by reviving the use of Steele's grafts and employing a new material to hold them in position claimed good results of great constancy attained under local anæsthesia, and their success should encourage others to proceed on the same or similar lines. Other methods and materials than those mentioned have been used for closing in areas of skin defect, the newest suggestion being that of Dr. Wederhake,[1] who points out that in the sacs of herniæ excised during radical cure every operating surgeon has abundant material at hand for grafting. The raw surface to be covered is, if possible, treated for some days before grafting with an aluminium acetate lotion and painted with fresh blood serum immediately before the graft is applied. When serum is unobtainable Bier's congestion method is employed to produce an exudation of lymph. The hernial sac is then applied to the raw surface with the endothelial layer away from the wound. Dry gauze or gauze covered with vaseline is laid on and the part bandaged and immobilised. Dr. Wederhake has had uniform success with his method, obtaining in each case a firm, painless, and

[1] Münch. med. Wochen. Military Supplement, June 12th.

non-adherent scar. Perhaps the most remarkable case he quotes is that of a woman whose life was rendered a misery by acne rosacea of the nose, to which all manner of treatment had been applied without success. The whole nose was peeled down to the cartilaginous and bony framework and a fresh hernial sac applied, which only required a moderate amount of tattooing later to resemble exactly the rest of the lady's complexion.

THE annual Representative Meeting of the British Medical Association began its sittings on Thursday, July 26th, at the Connaught Rooms, under the chairmanship of Mr. E. B. Turner.

THE House of the Royal Society of Medicine will be closed as usual for cleaning and library stock-taking during the whole of August. Officers of *all* the British Medical Services and of the American Medical Services will, however, be admitted to the library between the hours of 11 A.M. and 6.30 P.M. every day except Sunday.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Surgical Pneumothorax.

Professor René Lefort (médecin-major) recently reported to the Academy of Medicine his method of locating projectiles in the chest and their extraction by means of surgical pneumothorax. The essential point is the wide and speedy opening of the pleura, the resulting dyspnœa being no more severe than after a slow and methodical incision. Respiratory equilibrum is more readily re-established and the lung does not adhere to the wound during inspiration, forming a valve and rendering the rhythm irregular. Traumatopnœa does not appear until the moment when the wound is closed. In 40 per cent. of the operations performed by M. Lefort no unfavourable symptom on the part of heart or lungs was observed. No anxiety need therefore be felt by the surgeon in extensively opening the chest, the prognosis being as good in this operation as for a simple laparotomy.

A New Treatment of Psoriasis.

Dr. Louis Bory describes a new and interesting treatment of psoriasis based on the relation, admitted at the present time by many clinicians, between this disease and tuberculous toxæmia. The treatment consists of sulphur and eucalyptol combined in the following proportions: pure precipitated sulphur, 20 cgr.; eucalyptol, 20 gr.; oil of sesame, 80 gr. The oil is warmed gently until the sulphur is completely dissolved and the eucalyptol is then added. Each cubic centimetre contains 2 milligrammes of sulphur. 5 c.cm. of this solution (corresponding to 1 cgr. of pure sulphur) are injected deeply into the muscles of the buttock. In one case M. Bory was astonished to see large confluent patches distributed over the body, and extending even to the scalp, disappear in several days after a single injection. Recovery was maintained during several months. Four other cases recovered in about 12 days after three or four injections. This simple treatment of a refractory affection merits a trial.

Transmission of the Virus of Hæmorrhagic Jaundice by Rats.

Inado and Ido have shown in Japan that hæmorrhagic jaundice is due to inoculation of a specific spirochæte, but it was not known to them by what living agency the virus was transmitted. M. Jules Courmont and M. Durand (of Lyons) have demonstrated the presence with some frequency of these spirochætes in the rats of the Lyons sewers, confirming certain statements of earlier Japanese observers and of Martin and Pettit. The rat must, therefore, be considered as a possible transmitter of this disease, even in sporadic cases occurring in the trenches.

July 23rd.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Irish Counties War Hospital, Dublin.

THE Irish Counties War Hospital, a Red Cross hospital for wounded soldiers, is now established in Marlborough Hall, Glasnevin. It is fitted for between 200 and 300 patients and has been fully occupied for the past few weeks. On July 18th it was formally opened by Her Excellency Lady Wimborne. The premises, which are used in normal times as a house of residence for teachers in training, lend themselves excellently to the purposes of a hospital. The dormitories and day-rooms make bright, well-ventilated wards of convenient size, and a good theatre has been fitted up without much structural alteration. The house is in a good situation in large grounds in the open country, although included in the city boundary of Dublin, and within a mile and a half of the centre of the city. As a hospital it is maintained by a joint committee of the St. John Ambulance Association and the co. Dublin branch of the British Red Cross Society. It is in charge of Lieutenant-Colonel Seton Pringle, F.R.C.S.I., surgeon to Mercer's Hospital, who has the assistance on the medical side of Major W. G. Harvey, F.R.C.P.I., assistant physician to the Adelaide Hospital, and on the surgical side of Captain H. de L. Crawford, F.R.C.S.I., assistant surgeon to the Richmond Hospital. All of these gentlemen have served for a considerable time in France.

The Treatment of Tuberculosis.

At a largely attended meeting of the Tyrone Medical Association, presided over by Dr. E. C. Thompson, on July 17th, after careful consideration of the working of the Insurance Act the following resolutions were passed:—

That we recommend the Tyrone County Council to take the following matters into consideration—(1) Early notification of disease and isolation of advanced cases; (2) improvement of schools and proper provision for feeding of children and medical inspection of schools and children; (3) proper housing of the people and improvement of the houses of the middle farming class; (4) the Act to be administered through the dispensary districts; (5) slaughter of infected cattle.

That this committee is of opinion that if patients are to have sanatorium benefit the Tyrone Sanatorium should be opened as soon as possible.

There is a very strong feeling that no progress is being made in the prevention of tuberculosis in Ireland, and that vast sums of money are being spent in a misguided effort to grapple with such a deadly disease. Quite recently an urban council in co. Armagh declined to have anything to do with a child welfare scheme, on the ground of the failure of the effort to deal with consumption, their idea being that after the expenditure of money on this latter scheme no results have accrued, and that with such an experience they could not embark on another campaign of public health.

Craigavon Neurasthenia Hospital.

On Saturday afternoon, July 21st, Craigavon Neurasthenia Hospital, which is located in Craigavon, the beautiful residence of Colonel James Craig, M.P., which the owner has given as an institution for neurasthenic soldiers and sailors to the Committee of the Ulster Volunteer Force Hospitals, was opened by the wife of the owner, who handed it over as a hospital to Sir Edward Carson, M.P., and Mr. George N. Barnes, M.P. The Ulster Volunteer Force Hospitals Committee have appointed as visiting physicians Dr. William Calwell, Dr. R. W. Leslie, and Dr. H. L. McKisack, while Dr. T. Adamson (recently a house physician in the Royal Victoria Hospital) has been selected as resident medical officer.

Surgeon-General Sir William Macewen, F.R.S., R.N.

On Saturday evening, July 21st, Mr. Robert Campbell, President of the Ulster Medical Society, invited a number of medical friends to meet at dinner Professor Sir William Macewen, of Glasgow, who is Surgeon-General to the Naval Forces in Scotland, at Thompson's Restaurant, Belfast, when an extremely pleasant evening was spent, rendered all the more memorable by the many interesting reminiscences related by the distinguished guest.

July 24th.

THE EPIDEMIC OF POLIOMYELITIS IN NEW YORK IN 1916.

A DETAILED account of the great epidemic of poliomyelitis which occurred in New York State in 1916 is published in a Monograph[1] based on the official Reports of the Bureau of the Department of Health. The total number of cases in New York State was 13,164, with 3331 deaths. The former epidemic in 1912 had 1108 cases and 183 deaths.

Historical.

The Report is divided into 13 chapters. The first under the name historical deals with the starting of the epidemic and the special arrangements which were made for notification, quarantine, and detailed investigation of the disease. Special clinics were instituted, special ambulances were provided, all theatres and moving picture theatres were closed to children under 16, and public picnics and excursions were forbidden from July 5th to Sept. 25th, 1916. To accommodate the large number of cases several special hospitals were organised. It is interesting to note that "no attendant, physician, nurse, or domestic, and no patient admitted to any of the hospitals throughout the city for causes other than poliomyelitis during the epidemic contracted poliomyelitis." One of the "Field Nurses" of the Department engaged in daily house-to-house visits among the families where certain cases were isolated developed poliomyelitis in a severe paralytic form. The opening of the schools was postponed for 14 days till Sept. 25th, although it was recognised by the authorities that the attendance of children at schools played no part in the spread of the disease. They thought, however, that the unprecedented virulence and extent of the existing epidemic and unfamiliarity with the disease had engendered in the public such a state of mind that this concession to public alarm seemed advisable.

In order to obtain a supply of immune serum an appeal was sent out urging that those boys, girls, men, and women who themselves had suffered from poliomyelitis and who did not weigh less than 70 pounds would give their blood, and were asked to present themselves at an address for that purpose. In response to the appeal a very considerable amount of blood serum was obtained. The incubation and quarantine period was fixed at 14 days. The patients were quarantined for eight weeks from the start of the disease. Placards were placed on the street door and on the door of the room occupied by patient. The removal of all patients to hospital was insisted on except where special quarantine regulations could be carried out, and in one instance legal proceedings were taken by the parents against the Board of Health for the removal of a child whom the parents believed was not suffering from poliomyelitis, the court deciding in favour of the Board of Health. An interesting paragraph on some 230 suggestions emanating from various sources, medical and lay, as to the causes and cures from the disease might be quoted, but the reader must be referred to the original to realise how far fantasy may go.

Etiology and Epidemiology.—Insects as Carriers.

The second chapter deals with the etiology, and what is known as to the causes and transmission of the disease is shortly summarised. Experimental poliomyelitis in monkeys was produced from the virus of the 1916 epidemic, and it was shown that the Sapagon, a South American ring-tailed monkey, is insusceptible to the virus and therefore unsuited for experimental work, the Rhesus and Mangabeys being suitable.

Chapters III. and IV. are devoted to the epidemiology, and especially to the epidemic in 1916. Starting with 33 cases for the week ending June 3rd, the incidence rapidly rose to a maximum of 1206 cases for the week ending August 3rd, and gradually decreased to 6 cases for the week ending Nov. 18th. The ratio of death to cases was between 26–28 per cent., but in two weeks it rose to 31 per cent.; this is an unusually high mortality if one compares it with former epidemics. The age-incidence was about the same as in other epidemics—83 per cent. of the cases were under 5 years of age. Multiple cases in a family were present only in 4 per cent. of the total cases; 313 families had 2 cases, 28 had 3 cases, and 6 had 4 cases. Numerous other details were the subject of investigation—viz., sources of infection, abortive cases, incubation period—but for these reference must be made to the work.

Chapter V. deals with insects as carriers. The facts which lend colour to the belief that insects are concerned with transmission of the disease are numerous. The seasonal incidence corresponds with that of certain diseases known to be insect-borne. Certain enteric diseases show a marked summer increase; they also are partly spread by flies, but they never show the almost complete winter disappearance exhibited by poliomyelitis in this country. The disease has always been regarded as more abundant under rural conditions, and the present outbreak, although it has occurred in a large city, has not altered this belief; since the boroughs of Richmond and Queens, the only boroughs which are to any extent rural, have suffered more severely than their heavily populated neighbours. Insects of practically all kinds except those which depend entirely upon human beings for their existence are more abundant in proportion to the human population in the country. A short summary of a number of facts and observations of a more or less general nature are dealt with before the purely entomological standpoint is considered.

Some interesting features are brought out with regard to the contiguity of water and the greater incidence of cases. In the borough of Manhattan the cases have grouped themselves in a band along the front of the East and North Rivers with a narrow portion of the island almost entirely unaffected: the incidence per 1000 of the population being 1·46 contiguous to the water front and 0·81 removed from the front. In Brooklyn, again, abundant cases occur adjoining the water front from Joralemon-street to Hamilton-avenue. Staten Island, the least urban of the borough of Greater New York, has suffered very severely: with a population of less than 100,000 it has an incidence of nearly 3 per 1000. The triple greater incidence in Staten Island bears out previous experience that poliomyelitis is a rural disease more prevalent in thinly settled districts than in cities. The cases have, as a rule, been greatest in the poorer section and along the water front.

The conclusions reached on this side of the investigation are not so definite and complete as had been hoped. They do not completely disfavour the idea that the stable fly is implicated, although the behaviour of the present epidemic does not favour that view. It is possible with one assumption to form a working hypothesis based upon rats and fleas which seems to fit the epidemiological observations and general features, and in many details as well. The assumption is that the rat can act as a reservoir for the virus of poliomyelitis, and this should be capable of experimental proof. This by no means precludes the association of some other insect or warm-blooded animal or both. In fact, there is a continual appearance of circumstantial evidence that suggests a population other than the human one acting as an undercurrent and influencing the progress of the epidemic. When the many factors so far in doubt are generally made known it will be possible to attack the entomological side of the question with better promise of success. Among the unknown facts which cause the greatest confusion in interpreting epidemiological evidence are: (1) The length of the period of incubation; (2) the number of mild, abortive, and unrecognisable cases and carriers of the virus and their relation to infection and immunity; (3) the duration of infectivity in clinically recognised cases; (4) positive knowledge of the presence of the infective agent in insects, domestic animals, and other intermediate hosts and reservoirs of the virus.

The general status of the families makes no difference to the incidence of the disease. There is no relation between the sanitary condition and the incidence of cases; previous health seems to have no influence. Paralysis appeared before the fourth day in 71 per cent. of cases, and in 16 cases only was delayed till the tenth to the twenty-first day of the disease. The cases seem to follow the course of railroads; no milk- or water-borne outbreak of poliomyelitis was noted.

Condition of Nose and Throat.—Treatment.

An investigation was carried out with regard to the condition of nose and throat. A large number of the children showed marked hyperæmia of the naso-pharynx and throat; only a small percentage of cases previously operated on for tonsils and adenoids were found to be affected by the disease. Out of 2000 cases specially investigated 45 had been previously operated on; of these 46 per cent. recovered completely,

[1] Published under direction of the Department of Health of New York City, 139, Central-street, New York. Price $1.50.

whereas out of the unoperated cases 15 per cent. recovered completely. A further investigation of 1404 children in public schools was made to determine whether any children whose tonsils had been removed had been ill with poliomyelitis. Of the 1404 not one developed poliomyelitis during the epidemic, although in 18 instances cases occurred in the family and in 93 instances cases developed in the same house. The number of cases is too small to draw any definite conclusion, but they suggest that the removal of tonsil may influence the incidence and severity of the disease. The Lange colloidal gold test for the cerebro-spinal fluid has been extensively used and appears to be of some service in differentiating the fluids of poliomyelitis from those of tuberculous meningitis and from normal fluid.

Chapter XI. deals with the record of treatment employed. There is only one new point that requires careful consideration, and that is the use of serum. The types of serum used were: (*a*) immune serum from convalescent human cases; (*b*) normal human serum; (*c*) normal horse serum. The immune serum was taken from individuals who had recovered from poliomyelitis at intervals of a few months to several years. The serum was taken only from those in good health. A Wassermann test was made on all specimens of human serum before they were accepted for use. 113 cases were treated with immune serum. Details as to the obtaining and preserving the serum are given. Of 25 cases treated in the pre-paralytic stage 24 remained free from paralysis; one developed paralysis of both quadriceps extensors. Of 88 paralytic cases 38 died and 50 lived; of those that died, 18 died within 24 hours, and the majority were desperate cases before the injection was administered. Of the 50 that lived it is impossible to determine how much of the improvement was due to the serum. The conclusions reached are that whilst no absolute judgment of the value of a serum can be based upon the results obtained, they are nevertheless encouraging and justify the continuation of the serum treatment. Spot maps showing the monthly incidence of the disease in Brooklyn and the general distribution in Queens, Bronx, Richmond, and Manhattan are given, together with much statistical information in tabular form. The Monograph is a model of what can be done by the cordial and effective coöperation of the various workers of a State Department of Health, and the Commissioner, Haven Emerson, is to be greatly congratulated on the production of such a Report.

URBAN VITAL STATISTICS.

VITAL STATISTICS OF LONDON DURING JUNE, 1917.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in the City of London and in each of the metropolitan boroughs. With regard to the notified cases of infectious diseases, it appears that the number of persons reported to be suffering from one or other of the ten diseases specified in the table was equal to an annual rate of 3·4 per 1000 of the population, estimated at 4,237,387 persons; in the three preceding months the rates were 4·4, 3·7, and 3·5 per 1000 respectively. The lowest rates were recorded last month in Chelsea, the City of London, Battersea, Wandsworth, Camberwell, and Lewisham; and the highest rates in Stoke Newington, Holborn, Finsbury, Poplar, Southwark, Bermondsey, and Greenwich. Scarlet fever was less prevalent than it had been in any preceding month of this year; the greatest proportional prevalence of this disease last month was recorded in Kensington, Holborn, Southwark, Bermondsey, and Greenwich. There were 595 scarlet fever patients under treatment in the Metropolitan Asylums Hospitals at the end of last month, against 785, 712, and 613 at the end of the three preceding months; the weekly admissions averaged 83, against 102, 93, and 92 in the three preceding months. The prevalence of diphtheria showed a slight increase over that recorded in the preceding month; this disease was proportionally most prevalent last month in St. Pancras, Stoke Newington, Holborn, Finsbury, Bethnal Green, Poplar, Bermondsey, Greenwich, and Woolwich. The number of diphtheria patients under treatment in the Metropolitan Asylums Hospitals, which had been 1367, 1236, and 1048 at the end of the three preceding months, had declined to 1042 at the end of last month; the weekly admissions averaged 138, against 142 and 129 in the two preceding months. Enteric fever also was slightly more prevalent than it had been in other recent months; of the 34 cases notified during June, 4 belonged to Poplar, 4 to Southwark, and 4 to Greenwich. There were 31 enteric fever patients under treatment in the Metropolitan Asylums Hospitals at the end of the month, against 29, 25, and 27 at the end of the three preceding months; the weekly admissions averaged 6, against 6, 4, and 6 in the three preceding months. Erysipelas was proportionally most prevalent in Hampstead, Shoreditch, Stepney, Poplar, Southwark, Deptford, and Greenwich. The 17 cases of puerperal fever notified during the month included 3 in Islington, 2 in Poplar, and 2 in Woolwich. Of the 29 cases of cerebro-spinal meningitis, 3 belonged to Lambeth, and 2 each to Islington, Hackney, Holborn, Finsbury, Shoreditch, Southwark, Bermondsey, and Deptford; while 2 of the 6 cases of poliomyelitis belonged to Lambeth.

The mortality statistics in the table relate to the deaths of persons actually belonging to the several boroughs, the deaths occurring in institutions having been distributed among the boroughs in which

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING JUNE, 1917.

(*Specially compiled for* THE LANCET.)

CITIES AND BOROUGHS.	Estimated civil population, 1916.	Notified Cases of Infectious Disease.											Deaths from Principal Infectious Diseases.									
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cerebro-spinal meningitis.	Poliomyelitis.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Enteric fever.	Diarrhœa and enteritis (under 2 years).	Total.	Annual rate per 1000 persons living.	Deaths from all causes.	Death-rate per 1000 living.
LONDON	**4,237,387**	—	**340**	**553**	—	**34**	—	**17**	**133**	**29**	**6**	**1112**	**3·4**	—	**146**	**5**	**30**	**40**	**7**	**53**	**281**	**0·9**	**3892**	**12·0**
West Districts:																								
Paddington	130,668	—	5	20	—	—	—	1	4	1	—	31	3·1	—	12	—	2	2	—	3	19	1·9	128	12·8
Kensington	152,144	—	18	19	—	1	—	1	6	1	—	45	3·9	—	17	—	—	1	—	3	21	1·8	170	14·6
Hammersmith	117,965	—	10	10	—	2	—	—	4	—	1	27	3·0	—	10	—	1	2	—	3	16	1·8	113	12·5
Fulham	149,428	—	15	17	—	2	—	1	5	—	—	40	3·5	—	6	—	2	—	—	1	9	0·8	121	10·6
Chelsea	57,298	—	1	3	—	2	—	1	—	1	—	8	1·8	—	—	—	—	—	—	—	—	—	46	10·5
City of Westminster	132,853	—	11	15	—	2	—	1	—	—	—	29	2·8	—	—	—	1	—	1	—	2	0·2	133	13·1
North Districts:																								
St. Marylebone	98,573	—	9	11	—	—	—	—	3	—	—	23	3·0	—	4	—	—	2	—	1	7	0·9	97	12·8
Hampstead	81,470	—	3	7	—	2	—	—	5	—	—	17	2·7	—	5	—	—	—	—	—	5	0·8	59	9·4
St. Pancras	196,812	—	9	45	—	1	—	—	7	1	—	63	4·2	—	8	—	1	3	—	3	15	1·0	169	11·2
Islington	309,359	—	21	36	—	1	—	3	4	2	1	68	2·9	—	13	—	1	3	1	2	20	0·8	263	11·1
Stoke Newington	49,776	—	4	14	—	—	—	1	3	—	1	23	6·0	—	10	—	—	1	—	—	11	2·9	53	13·9
Hackney	209,636	—	17	17	—	—	—	—	5	2	—	41	2·5	—	3	—	1	2	1	1	8	0·5	169	10·5
Central Districts:																								
Holborn	38,161	—	5	10	—	—	—	—	1	2	—	18	6·1	—	6	—	—	—	—	—	6	2·0	53	18·1
Finsbury	74,230	—	8	14	—	—	—	1	2	2	—	27	4·7	—	2	—	1	—	—	—	3	0·5	83	14·6
City of London	20,113	—	1	1	—	—	—	—	1	—	—	3	1·9	—	—	—	—	—	—	—	—	—	18	11·7
East Districts:																								
Shoreditch	99,932	—	10	8	—	—	—	1	10	2	—	31	4·0	—	3	2	—	1	—	3	9	1·2	112	14·6
Bethnal Green	115,562	—	10	23	—	1	—	—	3	1	—	38	4·3	—	2	—	1	1	—	2	6	0·7	106	12·0
Stepney	258,396	—	22	33	—	—	—	—	14	1	—	70	3·5	—	8	—	1	2	—	8	19	1·0	271	13·7
Poplar	155,095	—	9	28	—	4	—	2	12	—	1	56	4·7	—	13	—	—	2	—	3	18	1·5	167	14·0
South Districts:																								
Southwark	177,166	—	22	28	—	4	—	—	8	2	—	64	4·7	—	1	—	2	5	—	2	10	0·7	166	12·2
Bermondsey	113,661	—	18	35	—	1	—	—	3	2	—	59	6·8	—	—	—	1	—	1	1	3	0·3	116	13·3
Lambeth	283,729	—	21	35	—	2	—	1	6	3	2	70	3·2	—	1	—	2	4	—	6	13	0·6	277	12·7
Battersea	159,402	—	15	12	—	—	—	—	2	1	—	30	2·5	—	6	—	2	1	—	2	11	0·9	135	11·0
Wandsworth	310,858	—	34	15	—	2	—	1	6	1	—	59	2·5	—	2	2	3	3	2	2	14	0·6	224	9·4
Camberwell	249,749	—	13	19	—	1	—	—	3	—	—	36	1·9	—	4	—	2	4	—	2	12	0·6	207	10·8
Deptford	107,696	—	5	18	—	—	—	—	7	2	—	32	3·9	—	3	—	1	—	—	3	7	0·8	107	13·0
Greenwich	94,452	—	14	24	—	4	—	—	5	1	—	48	6·6	—	5	—	2	—	—	—	7	1·0	108	14·9
Lewisham	162,901	—	6	12	—	1	—	—	1	—	—	20	1·6	—	—	—	2	1	—	—	3	0·2	109	8·7
Woolwich	130,313	—	4	24	—	2	—	2	3	1	—	36	3·6	—	2	1	1	—	1	2	7	0·7	112	11·2
Port of London	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

the deceased persons had previously resided. During the four weeks ending June 30th the deaths of 3892 London residents were registered, equal to an annual rate of 12·0 per 1000; in the three preceding months the rates were 18·3, 18·2, and 13·9 per 1000. The death-rates last month ranged from 8·7 in Lewisham, 9·4 in Hampstead and in Wandsworth, 10·5 in Chelsea and in Hackney, 10·6 in Fulham and 10·8 in Camberwell, to 14·0 in Poplar, 14·6 in Kensington, in Finsbury, and in Shoreditch, 14·9 in Greenwich, and 18·1 in Holborn. The 3892 deaths from all causes included 281 which were referred to the principal infectious diseases; of these, 146 resulted from measles, 5 from scarlet fever, 30 from diphtheria, 40 from whooping-cough, 7 from enteric fever, and 53 from diarrhœa and enteritis among children under 2 years of age. No death from any of these diseases was recorded in the City of London or in Chelsea; among the other boroughs they caused the lowest death-rates in the City of Westminster, Hackney, Finsbury, Bermondsey, and Lewisham; and the highest rates in Paddington, Kensington, Hammersmith, Stoke Newington, Holborn, and Poplar. The 146 deaths from measles were 19 in excess of the corrected average number in the corresponding period of the five preceding years; this disease was proportionally most fatal last month in Paddington, Kensington, Hammersmith, Hampstead, Stoke Newington, Holborn, Poplar, and Greenwich. The 5 fatal cases of scarlet fever were less than one-third of the corrected average number, and included 2 in Shoreditch, 2 in Wandsworth, and 1 in Woolwich. The 30 deaths from diphtheria were 7 below the corrected average number, and included 3 in Wandsworth, and 2 each Paddington, Fulham, Southwark, Lambeth, Battersea, Camberwell, Greenwich, and Lewisham. The 40 deaths from whooping-cough were 32 fewer than the corrected average, and included 5 in Southwark, 4 in Lambeth, 4 in Camberwell, 3 in St. Pancras, 3 in Islington, and 3 in Wandsworth. The 7 fatal cases of enteric fever showed a decline of 1 from the corrected average; 2 belonged to Wandsworth, and 1 each to the City of Westminster, Islington, Hackney, Bermondsey, and Woolwich. The 53 deaths from diarrhœa and enteritis among children under 2 years of age were 15 below the corrected average number, and included 8 in Stepney, 6 in Lambeth, and 3 each in Paddington, Kensington, Hammersmith, St. Pancras, Shoreditch, Poplar, and Deptford. In conclusion, it may be stated that the aggregate mortality in London last month from these principal infectious diseases was 14·3 per cent. below the average.

(Week ended July 21st, 1917.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 11·2, against 11·2 and 11·7 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 10·6, or 1·5 per 1000 below that recorded in the previous week; among the remaining towns the death-rates ranged from 3·7 in East Ham, 3·9 in Edmonton, and 4·2 in Hastings, to 17·0 in Barnsley, 17·1 in Middlesbrough, and 17·6 in Wakefield. The principal epidemic diseases caused 240 deaths, which corresponded to an annual rate of 0·7 per 1000, and included 100 from measles, 52 from infantile diarrhœa, 45 from whooping-cough, 27 from diphtheria, 9 from scarlet fever, and 7 from enteric fever. The deaths from measles were 16 below the number recorded in the previous week, and caused the highest annual death-rates of 1·7 in Walsall, 2·5 in West Hartlepool, and 4·1 in York. The 638 cases of scarlet fever under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 4 above, while the 1067 cases of diphtheria were equal to, the number remaining at the end of the previous week. Of the 3642 deaths from all causes in the 96 towns 138 resulted from violence. The causes of 25 deaths were uncertified, of which 5 were registered in Birmingham and 3 each in Liverpool and Darlington, but not one in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual death-rate was 12·5, against 13·0 and 13·7 per 1000 in the two preceding weeks. The 290 deaths in Glasgow corresponded to an annual rate of 13·6 per 1000, and included 25 from whooping-cough, 10 from measles, 4 from scarlet fever, 2 from infantile diarrhœa, and 1 each from enteric fever and diphtheria. The 64 deaths in Edinburgh were equal to a rate of 10·1 per 1000, and included 1 each from measles and diphtheria.

Irish Towns.—The 106 deaths in Dublin corresponded to an annual rate of 13·9, or 1·1 per 1000 less than that recorded in the previous week, and included 1 each from measles and whooping-cough. The 88 deaths in Belfast were equal to a rate of 11·7 per 1000, and included 3 from scarlet fever and 1 each from enteric fever, whooping-cough, diphtheria, and infantile diarrhœa.

THE LANCET, VOL. I., 1917: THE INDEX.

OWING to the continued shortage in the paper-supply, the Index and Title-page to the volume of THE LANCET which was completed with the issue of June 30th, 1917, have been printed separately, and copies have been supplied gratis to those subscribers who have, up to July 25th, intimated to us their wish to receive them. Other subscribers will be similarly supplied, so long as the stock remains unexhausted, on application to the Manager, THE LANCET Office, 423, Strand, London, W.C. Such applications should be sent in at once.

Correspondence.

"Audi alteram partem."

SKIN-GRAFTING.

To the Editor of THE LANCET.

SIR,—I have read with interest the article by Captain S. R. Douglas, Captain L. Colebrook, and Dr. A. Fleming on this subject in THE LANCET of July 7th. Since the contribution by Dr. E. Pearce Gould and myself to the *British Medical Journal* in 1915 I have, whilst at the Naval Hospital at Haslar, employed skin-grafting under local anæsthesia as an almost routine method of accelerating the healing of granulating wounds. The time saved, even with small wounds, in itself justifies the operation, and for wounds in proximity to joints and tendon sheaths skin-grafting ought to be the accepted and regular method of treatment as being the only one by which cicatricial contraction can be reduced to its minimum. I have always used Thiersch's method and obtain anæsthesia by infiltration with 1 per cent. novocaine solution. For small grafts a portion of skin is raised by injecting the solution beneath it, and the surface of this raised portion is removed with a sharp scalpel or Thiersch's knife. For larger grafts I have employed infiltration only by injecting the solution into the subcutaneous tissue in two lines diverging downwards from a point in the middle of the thigh about 4 inches below Poupart's ligament. In this way a large area of skin can easily be rendered anæsthetic. Using Thiersch's method small wounds can often be covered with one graft. For larger wounds I cut the grafts into pieces about the size of a threepenny-bit and work from the periphery to the centre of the wound. The grafting is done in stages, the later grafts being applied as soon as the previous ones are firmly established. For retaining the grafts in position I use a home-made dressing of one layer of dressing gauze, impregnated with paraffin wax. This is cut a good deal larger than the wound and attached around the edges with collodion paint. Through the meshes of the gauze a very free inspection of the grafts is possible. Over this I use a similar dressing to that described by the authors. I quite agree that daily dressing is of the greatest importance, as any grafts which may have become partially loosened or floated off can be readily seen and manipulated into contact again by rolling with a glass rod or by pressure with the gloved finger. These grafts would inevitably be lost if the dressings were not removed till the third or fourth day. Steele's method of obtaining the grafts as described by the authors should remove the only objection to the operation as done by Thiersch's method—namely, the time required for the healing of the denuded area, with the attendant risk of sepsis.

Although I have not kept any accurate record of the percentage of grafts which become adherent, I should say the total number lost has been extremely small except in wounds which were obviously at rather too late a stage for successful grafting. I have not found that the scars produced by the Thiersch method are unduly susceptible to injury and trophic ulceration, but I have not been able to keep my cases under observation sufficiently long to give a definite opinion on this point. I think the age of the wound has a great deal to do with the immediate success of the operation and with the strength and vitality of the skin later on. Old wounds with a large amount of hard cicatricial tissue and a poor blood-supply I have found very unfavourable for grafting, and even though the grafts take the results are disappointing.

The operation of skin-grafting is extremely simple and can easily be done at the patient's bedside. On this account and in view of the excellent results which can be obtained with a little practice, the method deserves a thorough trial by all surgeons who have to deal with granulating wounds, resulting either from gunshot injuries or burns. The instructions given by the authors of the paper are so concise and clear that I am sure if these are followed out accurately those who give the method a trial will be very surprised at the good results obtained and the large amount of time saved in the healing of extensive granulating wounds.

I am, Sir, yours faithfully,

CHARLES W. ARCHER, F.R.C.S. Eng.,
Temporary Surgeon, R.N.

July 14th, 1917.

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—The correspondence on this subject has travelled rather far from the Lumleian lectures and it has perhaps reached a stage where further discussion is unprofitable; but it is very desirable that we should drop the idea of there being two schools. The correspondence had its origin in Dr. F. J. Smith's objection to the Lumleian lecturer's application of recent research work to clinical medicine, and the controversy that has arisen since seems largely due to the fact that Sir James Mackenzie and Dr. Thomas Lewis are mixing up academic research with clinical medicine. These two things are as yet poles apart and only touch each other here and there upon the fringes, and any attempt to *force* the one upon the other is detrimental to both. By far the greater part of all the investigations that have resulted from Sir James Mackenzie's inspiring work lie in the realm of pure research, and their application to clinical medicine is as yet difficult and obscure; indeed, he himself admits that this is so when in his last letter he says with the charming humility of the true research worker: "This is what I have been doing for the last 30 years. I have not solved the problem." I have been privileged to know many members of the "old school," and neither in their writings nor their conversation have I ever detected anything but admiration for modern cardiac research; but they would be failing in their duty if they refrained from pointing out where the conclusions deduced from that research did not harmonise with their clinical experience. It may be questioned whether Sir James Mackenzie realises how much doubtful doctrine is built up by others on the foundations he has laid so well. There are too many people who put on the recent research work a strain greater than it will bear; there are also too many who having picked up the patter are satisfied that when they have talked learnedly of fibrillation or of damage to the junctional tissue there is no need to go further; and it is to these that the wording of certain passages in the first Lumleian lecture may unwittingly give encouragement. Take, for example, auricular fibrillation occurring in a case of mitral stenosis; Dr. Sutherland says that the symptoms previously attributed to cardiac failure are now ascribed to the presence of auricular fibrillation. How are we the better off? Surely we at once want to know why the auricle fibrillates, and can Dr. Sutherland give us any explanation without reverting to the old idea that the central factor in mitral stenosis is constriction of the mitral valve resulting in a mechanical failure which manifests itself in fibrillation. Again, Dr. Sutherland wishes us to give up the ideas of right-sided and left-sided failure, and he says that the two sides "work together, suffer together, give rise to disturbances together and fail together"; this is an assumption that underlies much of the application of the research work to clinical work, but what evidence can he produce? Surely the clinical phenomena combine with the facts of the autopsy room to prove the contrary in many cases.

That one criticises such remarks as these does not imply that one controverts the facts that experimental work has established, or denies in any way the immense importance of the knowledge gained from those facts; it merely emphasises the need for recognising the limits that separate academic research from clinical medicine. Research in cardiac disease differs in no material way from other lines of research merely because it is fortunate in one of its branches in being able to utilise human material for the purpose of its experiments.

I am, Sir, yours faithfully,
GORDON W. GOODHART.

Warwick Gardens, W., July 14th, 1917.

THE CAUSATION OF SEX.

To the Editor of THE LANCET.

SIR,—As a breeder of pedigree shorthorns I am financially interested in the question of sex to a considerable extent. I have tested the alternate ovary theory in a large herd of shorthorns, and the results I obtained were negative.

Mr. John Lewis Bonhote ("Vigour and Heredity," West, Newman and Co.) gives the results of his experiments, which go to show that sex is largely determined by the vigour of the zygote at the time of conception, which is in turn equal to the mean of the vigour of the two parents at the time of service. His experiments definitely prove that low-vigoured animals produce a larger proportion of males than high-vigoured animals, and that high-vigoured animals produce a larger proportion of females. The experience of cattle-breeders bears this out. In the case of old cows the vigour is low and we get a very high proportion of bull calves. Again, if we use immature bulls of 10 to 12 months we get a large proportion of bull calves again, since the vigour of the sire has not yet reached its full development. If we follow out this argument we see how a large proportion of babies born in war-time are boys. The vigour of the parents is lowered by the privations and mental anxiety the civilian population experience at these times and consequently their low vigour produces a large proportion of boys.

Mr. Bonhote shows how variations in vigour affect the Mendelian expectation and thereby influence heredity. In the *Live Stock Journal* for Oct. 14th, 21st, and 28th, and Nov. 5th of last year there is an article of mine in which I have applied Mr. Bonhote's vigour theory to the practical breeding of pedigree cattle.

I am, Sir, yours faithfully,
HORACE G. REGNART, M.A.

Albury, Tiddington, Oxon., July 18th, 1917.

*** Biological work on the problem has been largely suspended during the war, but when resumed should bear some definite fruit.—ED. L.

INCENTIVES TO SCIENTIFIC STUDY.

To the Editor of THE LANCET.

SIR,—At a general meeting of the Association of Science, Limited, held on July 11th, it was unanimously resolved:—

1. That a liberal education should in all cases include sound elementary instruction in biology, botany, chemistry, and physics.
2. That the status of science masters and teachers should be substantially improved.
3. That the position and payment of scientific workers are at present, in general, inadequate and ought to be raised.
4. That increased opportunities and incentives for scientific studies and research should be provided for persons above school age, so as to be available for those who are employed during the greater part of the day in various avocations.

And I was directed to forward to you a copy of these resolutions. I am, Sir, yours faithfully,
HUGH WOODS,
Secretary.

The Red House, Bordyke, Tonbridge, July 14th, 1917.

METROPOLITAN HOSPITAL SUNDAY FUND.

THE following are among the amounts received at the Mansion House:—

All Saints', Ennismore-gardens, £179; St. Jude's, South Kensington, £165; Bickley Parish Church, £163; St. Peter's, Cranley-gardens, £146; St. Paul's, Onslow-square, and Mission, £134; Halstead Parish Church, £118; Emmanuel, Wimbledon, £106; Westminster Abbey, £102; Anon. and Mr. J. Alec Roberts, £100 each; St. James's, Piccadilly, £96; St. Michael's, Blackheath, £87; Aldenham Parish Church, £85; St. Mark's, Reigate, £84; St. Luke's, Redcliffe-square, £81; St. Olave's, Hart-street, £80; Chislehurst Parish Church, with St. John's, and Hampstead Congregational Church, £71 each; St. Michael's, Paddington, £70; St. Anne's, Wandsworth, £68; Ilford Churches, £64; St. Helen's, Bishopsgate, £64; St. Paul's, Upper Norwood, £64; Mill Hill Congregational Church, £55; Holy Redeemer, Stoke Newington, St. George's, Perry Hill, and Christ Church, North Finchley, £51 each; Wellington Barracks Chapel and Chapel Royal, Hampton Court, £50 each; Weybridge Parish Church, £49; Gray's Inn Chapel, £45; St. Mary, Graham-street, and All Saints', Croxley Green, £44 each; St. Stephen's, Westminster, £43; Christ Church with St. George's, Watford, £42; All Saints', Notting Hill, £41; St. Mary Magdalene, Munster-square, £40; St. Stephen's, Hampstead, £38; Wimbledon R. C. Church, £37; Holy Trinity, Upper Tooting; West Wickham Parish Church, St. Thomas's, Old Charlton; and Park Chapel, Crouch End, £36 each; All Saints', Plumstead, £35; St. Peter's, Clapham, £33; St. Stephen's, Battersea, and St. Peter's, Arkley, £32 each; Hendon Parish Church and Blackheath Congregational Church, £31 each; St. Thomas's, Streatham, £30; Westminster Chapel and Christ Church, Harlesden, £29 each; St. Luke's, Bromley, Kent, and St. Andrew's, Muswell Hill, £28 each; Tooting Wesleyan Mission and Barnes Parish Church, £27 each; St. Bartholomew the Great, E.C., Hackney Parish Church, and St. Matthew's, Brixton, £26 each; St. Mary's, West Kensington, St. Matthew's, Westminster, Mr. Norman McCorquodale, and St. Mary, Shenfield, £25 each; Emmanuel, Northwood, Hillingdon Parish Church, Willesden Green Baptist Church, and St. John's, Deptford, £24 each; St. Paul's, Forest Hill, £23, All Saints', Harrow Weald, St. John's, Walthamstow, and Christ Church, Cockfosters, £22; Miss Oliverson and Mrs. Eyres Monsell, £20 each.

The total already available for distribution now amounts to about £59,000.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Died.

Capt. F. A. Deravin, Australian A.M.C.

Wounded.

Capt. G. MacK. Miller, M.C., R.A.M.C.
Capt. C. P. Rosenthal, Australian A.M.C.
Capt. J. G. A. Campbell, Canadian A.M.C.
Capt. F. G. Macnaughton, R.A.M.C.
Lieut. F. Corner, R.A.M.C.
Capt. W. E. David, M.C., R.A.M.C., attached Cameron Highlanders.
Capt. E. H. Helby, R.A.M.C.
Capt. E. M. B. Payne, R.A.M.C.
Capt. H. D. Smart, M.C., R.A.M.C., attached Lincolnshire Regiment.
Capt. G. D. Eccles, R.A.M.C.
Capt. A. J. Howes, R.A.M.C., attached Royal Irish Rifles.
Capt. P. W. Edwards, R.A.M.C.
Capt. J. W. Linnell, R.A.M.C.
Capt. C. G. Skinner, R.A.M.C., attached Manchester Regiment.

Wounded and Missing.

Capt. H. C. Ward, M.C., R.A.M.C., attached K.R.R.C.

Previously reported Wounded, now reported Not Wounded.

Capt. E. A. Walker, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported :—

H. S. R. Woodforde, Australian Imperial Force, killed in action, fourth son of Dr. W. S. R. Woodforde, of Goondiwinde, Queensland, Australia.

Major P. S. S. Woodforde, Australian Imperial Force, died of wounds, eldest son of the late Dr. A. E. Woodforde, of Uralla, New South Wales, Australia.

Second Lieut. C. A. Green, M.C., Royal Garrison Artillery, killed in action, son of the late Dr. A. Green, of Gateshead.

Capt. W. R. Pasteur, Royal Field Artillery, killed in action, only son of Colonel W. Pasteur, A.M.S., of Chandos-street, Cavendish-square, London.

Midshipman C. A. G. Cooke, R.N., killed in the explosion on H.M.S. *Vanguard*, eldest son of Lieut.-Col. A. Cooke, R.A.M.C. (T.), of Cambridge.

G. P. Garlike, Somerset Light Infantry, died in hospital abroad, second son of the late Dr. J. P. Garlike, of Sutton Benger, Wilts.

Capt. C. C. Welsh, Royal Field Artillery, killed in action, elder son of Dr. R. C. Welsh, of Biggleswade, Beds.

THE HONOURS LIST.

The following awards to medical officers are announced:—

Distinguished Service Order.

Temp. Capt. James Harding Barry, M.C., R.A.M.C., attached London Regiment.

For conspicuous gallantry and devotion to duty in attending to the wounded under exceptionally trying conditions. Under very heavy shell fire he dug out five men who were buried and amputated two men's legs on the spot. He showed utter disregard of any personal risk and his example was splendid.

Major Lionel Wilfred Bond, Australian A.M.C.

For conspicuous bravery and devotion to duty. When in charge of advanced collecting and forwarding posts his total disregard of danger under a terrific hail of gas shells, H.E., and shrapnel fire gained him the confidence of all ranks, and greatly assisted the evacuation of the wounded. Later, although wounded and partly gassed, he refused to leave his post, and his bravery and devotion saved a very critical situation.

Major Herbert Percival Brownell, Australian A.M.C.

For conspicuous gallantry and devotion to duty whilst attending to the wounded under heavy fire. His coolness in organising matters amidst the greatest confusion enabled the wounded to be expeditiously treated, and he personally treated some hundreds of cases under heavy shell fire.

Major Horatio Victor Patrick Conrick, Australian A.M.C.

For conspicuous gallantry and devotion to duty in attending to the wounded. He proceeded to the scene of an explosion under very heavy shell fire, and personally directed the removal of the wounded. His fearlessness and disregard for his personal safety has been marked on all occasions.

Temp. Capt. James Henry Fletcher, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed the utmost bravery and coolness when commanding the bearers. He worked continuously under artillery and machine-gun fire. It was largely due to his gallant conduct that so many wounded were safely evacuated.

Bar to the Military Cross.

Temp. Capt. Charles Bromley Davies, M.C., R.A.M.C.

For conspicuous gallantry and devotion to duty. He was in command of the bearer division when evacuation was most difficult. He showed great gallantry and resource in pushing forward under heavy fire and rescuing several wounded men. (The award of the M.C. was recorded in THE LANCET of Sept. 2nd, 1916, p. 450.)

Temp. Capt. James Churchill Dunn, M.C., R.A.M.C., attached Royal Welsh Fusiliers.

For conspicuous gallantry and devotion to duty in attending to the wounded. He crawled close up to the enemy's wire, accompanied by another officer, and brought in a wounded man on a waterproof sheet. (The award of the M.C. was recorded in THE LANCET of Sept. 2nd, 1916, p. 450.)

Temp. Capt. Harold Garnett Janion, M.C., R.A.M.C., attached R.H.A.

For conspicuous gallantry and devotion to duty. He was assisting to remove the pilot from a wrecked aeroplane when the spot came under heavy fire from a hostile battery. Several of the bearers were wounded, but by his courage and example this officer collected fresh bearers and conveyed the wounded men to safety. This task was carried out under continuous shell fire. (The award of the M.C. was recorded in THE LANCET of June 26th, 1915, p. 1373.)

Capt. Maurice Baylis King, M.C., R.A.M.C., Spec. Res.

For conspicuous gallantry and devotion to duty in rescuing wounded under very heavy shell fire. His fearlessness set a splendid example to the stretcher-bearers, who were then much shaken by the heavy shelling. (The award of the M.C. was recorded in THE LANCET of Jan. 6th, 1917, p. 38.)

Capt. George Seabourne Robinson, M.C., Australian A.M.C.

For conspicuous gallantry and devotion to duty. He displayed great courage and determination in attending wounded under heavy fire. On one occasion he personally led a party out in front of our line for the purpose of searching and attending the wounded not yet collected. (The award of the M.C. was recorded in THE LANCET of June 9th, 1917, p. 894.)

Temp. Capt. James Lennox Stewart, M.C., R.A.M.C., attached Gordon Highlanders.

For conspicuous gallantry and devotion to duty. He behaved with the utmost gallantry in removing the wounded under shell fire. He continued to work in the open exposed to severe shell and machine-gun fire until every wounded man had been brought in. (The award of the M.C. was recorded in THE LANCET of May 20th, 1916, p. 1059.)

Military Cross.

Temp. Capt. Frederick Carson, R.A.M.C., attached Royal West Kent Regiment.

For conspicuous gallantry and devotion to duty. He behaved with the greatest gallantry in attending wounded under continuous heavy shelling. His total disregard for personal safety set a fine example to those around him.

Temp. Capt. Henry Joseph Cotter, R.A.M.C., attached Lincolnshire Regiment.

For conspicuous gallantry and devotion to duty. Although wounded on the previous day, he declined to be relieved, and continued to dress wounded in the open under heavy fire, going through heavy barrage to reach some men lying out in an exposed position.

Temp. Capt. Albert Victor Craig, R.A.M.C., attached R.F.A.

For conspicuous gallantry and devotion to duty. Though suffering himself from the effect of gas shells, he displayed the greatest bravery and the most untiring energy in attending to the wounded under fire of heavy guns and gas shells. He risked his life day and night without the slightest hesitation.

Temp. Capt. John Nissen Deacon, R.A.M.C., attached East Yorks Regiment.

For conspicuous gallantry and devotion to duty. He showed exceptional bravery and resource on several occasions in attending to the wounded under very heavy shell fire, with complete disregard of his own personal safety.

Temp. Lieut. Cyril Duncan, R.A.M.C.

For conspicuous bravery and devotion in attending wounded close to a large ammunition dump which was on fire, with splinters and shrapnel shells flying about, and later, though partially gassed, attended wounded under heavy gas shell fire.

Capt. Hugh Hart, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He displayed the utmost gallantry and courage in attending wounded continuously under heavy shell fire.

Temp. Capt. James Duncan Hart, R.A.M.C., attached London Regiment.

For conspicuous gallantry and devotion to duty. He commanded an aid post close to a piece of heavily shelled roadway. He continually went out into the open road and attended wounded men under heavy fire, with a total disregard for his own personal safety.

Temp. Capt. Charles Reginald Ralston Huxtable, R.A.M.C., attached Lancashire Fusiliers.

For conspicuous gallantry and devotion to duty. He showed the utmost skill and bravery in attending to and evacuating wounded. When seven of his bearers were buried by a shell he at once, despite the intense hostile bombardment, organised a party and dug them out.

Temp. Capt. Charles Clouston Irvine, R.A.M.C., attached East Yorks Regiment.

For conspicuous gallantry and devotion to duty. He took his stretcher-bearers out under heavy barrage fire and brought the wounded back safely, carrying one man back on his shoulders. His complete disregard for his own personal safety was most marked.

Capt. Cyril Jacobs, R.A.M.C., Spec. Res., attached Lincolnshire Regiment.

For conspicuous gallantry and devotion to duty. After an assault he went out over the whole ground in daylight, cleared as many of the wounded as possible, and having located the wounded who were in the enemy's wire and close to it, completed his task by nightfall. He succeeded in evacuating all wounded men.

Temp. Capt. Richard Orthin Hilton Jones, R.A.M.C.

For conspicuous gallantry and devotion to duty. For many hours he had to occupy a most exposed position under heavy fire, where he dressed and attended wounded at great personal risk.

Capt. Douglas Ballantyne Kennedy, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. He directed the work of the stretcher-bearers for 48 hours without rest and repeatedly aided the wounded under very heavy shell fire.

Temp. Capt. Francis Kenneth Kerr, R.A.M.C., attached Royal Scots Fusiliers.

For conspicuous gallantry and devotion to duty. During heavy and accurate hostile fire he continued to dress wounded, although the building was hit several times. His fine example was of the utmost value to those around him.

Capt. Charles Herbert Leedman, Australian A.M.C.

For conspicuous gallantry and devotion to duty. Although he and several of his staff were wounded by the heavy shelling of his post by the enemy, he continued, with the greatest gallantry, to attend the wounded, remaining at his post until it became untenable.

Capt. (now temp. Major) Ronald Hugh Macdonald, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. One of our aeroplanes was shot down, the observer was wounded and pinned beneath the wreck. This officer and a bearer went out in full view of the enemy, who were shelling the machine, and extricated the wounded man and removed him to safety. He himself was severely wounded while doing so.

Temp. Capt. Randal Vivian McDonnell, R.A.M.C., attached Bedfordshire Regiment.

For conspicuous bravery and devotion. For over 48 hours he attended more than 200 wounded, many having to be dressed in the open under heavy fire. His total disregard of personal danger was beyond praise.

Temp. Lieut. Joseph Randolph Morell Mackenzie, R.A.M.C., attached South Staffordshire Regiment.

For conspicuous bravery and devotion on numerous occasions when attending wounded and leading stretcher-bearer parties under every kind of heavy and continuous fire, and invariably exhibiting great skill, coolness, and contempt of danger.

Capt. Malcolm McGillivray, R.A.M.C., Spec. Res., attached South Wales Borderers.

For conspicuous gallantry and devotion to duty. Although his dressing station was twice blown in and himself extricated with great difficulty, he continued to attend wounded under heavy shell fire.

Temp. Capt. Daniel McKelvey, R.A.M.C., attached Gordon Highlanders.

For conspicuous gallantry and devotion to duty. During an attack by his battalion he followed them closely and attended to the wounded in the open under very heavy fire. His fearlessness and gallant conduct throughout the operations was most marked.

Temp. Capt. Murdo McKenzie McRae, R.A.M.C., attached Northumberland Fusiliers.

For conspicuous gallantry and devotion to duty. Owing to the shortage of bearers this officer carried in during the night seven or eight wounded men who otherwise would have died in the snow. He has performed consistent good work throughout.

Capt. Robert James Manion, Canadian A.M.C.

For conspicuous gallantry and devotion to duty. While going forward through a heavy hostile barrage to establish an aid post he, at great personal risk, stopped and dressed alone nine wounded men.

Temp Capt. Arthur Gilbert Michelsen Middleton, R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed great gallantry and bravery in carrying in two wounded men under heavy hostile shelling. He displayed the utmost disregard for danger throughout in carrying out his duties.

Capt. Cyril Charles Minty, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He showed the greatest courage and fearlessness in attending wounded whilst exposed to heavy shell fire and gas fumes, and assisting to carry them to the collecting post. The stretcher-bearers had suffered severe casualties, and it was owing to his magnificent example that they maintained their courage and endurance.

Temp. Capt. George Lynn Pillans, R.A.M.C.

For conspicuous gallantry and devotion to duty. He showed great determination and courage in leading bearer squads through heavy barrage. This he did several times, and throughout superintended the evacuation under heavy shell fire.

Temp. Lieut. Joseph Rickards, R.A.M.C., attached Royal Scots.

For conspicuous gallantry and devotion to duty. He attended a large number of wounded in a barn which was under heavy shell fire. During the night he organised a party which brought in many wounded from an exposed position on the battlefield.

Temp. Capt. John Finlayson McGill Sloan, R.A.M.C.

For conspicuous gallantry and devotion to duty. His dressing station being blown in on the top, he dressed over 200 cases under very difficult conditions. He had to change his dressing station twice.

Temp. Lieut. (temp. Capt.) Harry Neville Stafford, R.A.M.C.

For conspicuous gallantry and devotion to duty. Having received a message that many wounded were on heavily shelled ground, he organised rescue parties and brought them all in, although he was severely wounded in this gallant work.

Temp. Capt. Charles Gordon Timms, R.A.M.C., attached Royal Fusiliers.

For conspicuous gallantry and devotion to duty. For two days he attended the wounded in the open under heavy and incessant shell fire, quite regardless of personal danger, and his coolness and energy alleviated much suffering.

Temp. Capt. William Annandale Troup, R.A.M.C., attached Wiltshire Regiment.

For conspicuous gallantry and devotion to duty. He displayed the utmost skill and endurance in clearing the wounded between the lines after the attack. Through the day he carried out his task under continuous shell fire, and was thus instrumental in saving many lives.

Capt. Alexander Guthrie Semple Wallace, R.A.M.C., Spec. Res., attached Royal Lancashire Regiment.

For conspicuous gallantry and devotion to duty. He continued to attend wounded men in the front-line trench despite hostile bombardment. His total disregard for personal danger set a fine example to those around him.

Temp. Capt. Robert Bruce Wallace, R.A.M.C., attached Leicestershire Regiment.

For conspicuous bravery and devotion on many occasions, and notably when suffering from a painful wound he not only continued to dress wounded, but went out with stretcher-bearers under heavy fire and dressed and brought in men unable to move.

Temp. Capt. Donald Alexander Warren, R.A.M.C., attached Royal Warwickshire Regiment (Lieut., C.A.M.C.).

For conspicuous gallantry and devotion to duty. He continued to attend wounded for over an hour under heavy artillery and machine-gun fire and in full view of the enemy. Later he established an aid post, and carried on for 48 hours without rest under continuous fire.

Temp. Capt. Philip James Watkin, R.A.M.C., attached Bedfordshire Regiment.

For conspicuous gallantry and devotion to duty. For two days he dressed wounded under heavy shell fire, and, when the captured trenches had been cleared, he commenced to search the shell holes in "No Man's Land," in spite of heavy sniping fire, until ordered to desist.

In a despatch from Cape Town, dated March 10th, 1917, dealing with operations in Rhodesia from the outbreak of war to the beginning of 1916, it is mentioned that the *Distinguished Service Cross* was conferred upon Surgeon H. McHanschell, R.N.

MENTIONED IN DESPATCHES.

The names of the following medical officers are mentioned in a despatch, dated March 29th, 1917, received from Lieutenant-General G. F. Milne, C.B., D.S.O., for "distinguished service" rendered during the six months ending in March last in connexion with operations in Salonica:—

Army Medical Service.—Temp. Col. F. D. Bird, C.B.

Royal Army Medical Corps.—Lt.-Col. (temp. Col.) J. C. Connor; Lt.-Col. (temp. Col.) G. T. K. Maurice, C.M.G.; Lt.-Col. (temp. Col.) P. MacKessack; Maj. (temp. Lt.-Col.) J. Matthews; Capt. (actg. Lt.-Col.) P. G. M. Elvery, M.C.; Capt. (actg. Lt.-Col.) A. D. O'Carroll; Capt. (actg. Lt.-Col.) G. H. Stevenson; Capt. (actg. Lt.-Col.) B. Johnson; Maj. W. J. Weston; Maj. R. K. White; Maj. F. J. Garland; Maj. P. H. Henderson, D.S.O.; Temp. Maj. H. Wiltshire; Capt. (temp. Maj.) C. M. Fegen; Capt. J. H. Beverland; Capt. R. G. Shaw; Capt. D. V. M. Adams, Res. of Off.; Capt. A. L. Urquhart; Capt. J. P. Litt; Capt. C. Clarke; Capt. D. M. Corbett; Capt. C. S. Staddon, Spec. Res.; Temp. Capt. D. Bird; Temp. Capt. W. H. Fleetwood; Temp. Capt. St. J. D. Buxton; Temp Capt. R. S. Dewar; Temp. Capt. G. B. Holroyde; Temp. Capt. W. A. L. H. Henderson; Temp. Capt. A. G. Howson; Temp. Capt. J. H. Box; Temp. Capt. J. H. Cuthbert; Temp. Capt. J. F. W. Leech; Temp. Capt. J. M. Mactie; Temp. Capt. C. A. Boyd; Temp. Capt. F. Paine; Temp. Capt. S. H. Hay; Temp. Capt. T. E. Parker; Temp. Lt. J. M. Hammond, D.S.O. (died of wounds); Capt. R. O. Eades; Maj. (temp. Lt.-Col.) D. L. Fisher; Capt. E. G. Gauntlett; Maj. (temp. Lt.-Col.) A. E. Kidd; Capt. J. Mair; Capt. G. P. Mills; Temp. Maj. K. W. Montsarrat; Capt. W. L. Murphy; Capt. L. G. Parsons; Capt. F. H. Robbins; Capt. F. Scroggie; Capt. (temp. Maj.) W. D. Sturrock; Maj. E. B. Waggett; Capt. V. H. Wardle; Lt.-Col. J. R. Whait; Capt. T. Carnwarth.

Canadian Army Medical Corps.—Lt.-Col. W. B. Hendry; Lt.-Col. E. J. Williams; Maj. C. S. McVicar; Maj. H. C. Parsons; Capt. W. A. Clarke; Capt. J. E. Campbell; Capt. J. G. W. Johnson.

Indian Medical Service.—Maj. E. Bisset.

The names of the following medical officers are to be added to the list of those "Mentioned in Despatches" given in THE LANCET of June 2nd, 1917, p. 856:—

Lt.-Col. G. H. Goddard, R.A.M.C.; Temp. Capt. (acting Lt.-Col.) L. D. Shaw, R.A.M.C.; Capt. G. E. Cole, Australian A.M.C.

FOREIGN DECORATIONS.

Russian.

Order of St. Stanislas, 2nd Class (with Swords).—Fleet-Surgs. J. H. Pead and R. S. Osborne. (The names of Fleet-Surgs. C. M. Beachell and E. C. Cridland are to be deleted from the list given in THE LANCET of June 9th, 1917, p. 894.)

OBITUARY OF THE WAR.

SAMUEL POOL, M.B., CH.B. LIVERP.,

MILITARY CROSS,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain Samuel Pool, who was killed in action in France on June 16th at the age of 23, was the second son of Samuel Pool, of Aigburth, Liverpool. He received his early education at Upper Park-street Elementary School, where he gained a Junior City Scholarship to the Liverpool College Middle School. He was later successful in gaining another scholarship, which took him to the University of Liverpool, where he studied medicine, with the intention of becoming a medical missionary. In 1913 he was awarded the Torr gold medal for anatomy, and a year later the Holt bronze medal for physiology. During 1915–16 he acted as house surgeon at the Royal Infirmary, Liverpool, and as obstetric assistant at the Brownlow Hill Maternity Home. After graduating M.B., Ch.B., with honours, in March, 1916, he immediately applied for a commission in the R.A.M.C., leaving for France a few weeks later, and in November was awarded the Military Cross for his work on the Somme.

One of his Liverpool teachers writes of him: "I had the highest opinion of his abilities and character. As my house surgeon at the infirmary he was one of the best I ever had, and I had looked forward to his having a great career." Other letters testify to the affectionate regard in which he was held by his fellow students.

WILLIAM BRIGGS GRANDAGE, B.A., M.D. CAMB.,

LIEUTENANT-COLONEL, ROYAL FIELD ARTILLERY.

Lieutenant-Colonel W. B. Grandage, commanding a brigade of the Royal Field Artillery, who was killed on May 14th, was in his thirty-eighth year and the fifth son of A. Grandage, of Rawdon, near Leeds. He was educated at Sedbergh School, where he already showed athletic promise. At Clare College, Cambridge, he was a fine cross-country runner and ran for the University against Oxford; he also played Rugby football for his College and for the University. Taking his degree in 1902, he entered St. Bartholomew's Hospital, still finding time to represent the hospital at football, playing also for Middlesex County and the Harlequins. He took great interest in the Musical Society. After qualifying he became house physician at his own hospital and later house surgeon at the Victoria Hospital for Children and resident medical officer at Queen Charlotte's Hospital. After taking the M.D. Cantab. in 1908 he started private practice in South Kensington, where he showed great promise of success in his profession and was for some years a member of the borough council.

While still at the hospital he joined the 3rd Kent, Royal Arsenal Artillery, remaining with them when they became the 2nd London Brigade R.F.A. (T.), and held the rank of Captain when war broke out. On mobilisation he gave up his practice and threw himself with great energy into his new life. He was for a time second in command of a reserve brigade before being given charge of the Artillery Section of the O.T.C. at London University. Later he was promoted to the rank of Lieutenant-Colonel with command of a brigade. Going to the front in February, 1917, he was killed by shell fire three months later.

A medical friend writes of Colonel Grandage as a man of great energy and many interests and who threw himself into whatever he undertook with a keenness which those who worked with him will never forget. His death leaves a gap in the many circles in which he moved, and in all of which he had hosts of friends. Colonel Grandage married in 1915 the daughter of the late J. Landale, of Woodmill, Falkland, Fife, and leaves a widow and an infant son.

WILLIAM GUTHRIE PORTER, M.B., B.SC., F.R.C.S. EDIN.,

DISTINGUISHED SERVICE ORDER,
MAJOR, ROYAL FIELD ARTILLERY.

Major W. G. Porter, who held a combatant commission and was killed in action in France on June 9th, received his education at Edinburgh University, where he took a science degree in 1898 and a medical degree four years later. He remained in Edinburgh to practise as a surgeon in diseases of the ear, nose, and throat, holding several important appointments, among them that of surgeon to the ear and throat department of the Royal Hospital for Sick Children, surgeon to the Edinburgh Eye, Ear, and Throat Infirmary, and aurist to the Royal Institution for the Education of the Deaf and Dumb. At the outbreak of hostilities in August, 1914, he held captain's rank in the Royal Field Artillery Territorial Force, with which in the autumn of 1915 he went on active service. He was promoted to the rank of Major and received the D.S.O. only a few days before his death.

A medical colleague writes of Major Porter as an efficient and popular officer who won the affection of fellow officers and men by his cheerful disposition, his fearlessness, and his kindly consideration for others. He was a sound clinician, a careful observer, and a skilful operator, who had already made his position in his own branch of medicine. His book on "Diseases of the Ear, Nose, and Throat," published in 1912, had reached a second edition and proved eminently useful in the instruction of the senior student and practitioner. His studies on the application of the X ray to the anatomy and to the diagnosis of diseases of the accessory nasal sinuses were regarded as pioneer work; and other papers showed both scientific ability and the gift of conveying his knowledge to others. His death creates a distinct blank in the Edinburgh medical school.

R.A.M.C. AUXILIARY FUND.—The following is the list of donations, amounting to a total of £73 9s., received for the Officers' Benevolent Branch of this Fund for the quarter ending June 30th:—

Captain H. Richmond, Major T. H. Ray, Captain E. D. Pineo, and Captain K. Macewen, £5 each; Officers' Training Centre, Birr, £42 3s.; and Dr. Stephen J. Henry, £10 10s.

ROYAL SOCIETY OF MEDICINE.—The House of the Royal Society of Medicine will be closed for cleaning and stock-taking during the month of August, but officers of the British and American Medical Services will still be able to use the library on week-days between the hours of 11 A.M. and 6.30 P.M.

THE MEDICAL SERVICES IN MESOPOTAMIA.

In a despatch received from Lieut.-General Sir Stanley Maude, K.C.B., Commander-in-chief of the Mesopotamia Expeditionary Force, and dealing with the operations of his force from the date of his appointment, August 28th, 1916, to March 31st, 1917, three weeks after the fall of Baghdad, the work of the medical services and of the British Red Cross Society is referred to in the following terms:—

Since the termination of the hot weather the health of the troops has been uniformly good, and our well-equipped hospitals have been more than adequate to meet the calls made upon them by sick patients. Throughout the operations the evacuation of the wounded was carried out on model lines, and the arrangements made for the comfort and rapid transfer of patients from the field units to the hospitals on the lines of communication reflect much credit on those concerned. Whilst those on the lines of communication have done their share efficiently, the work of the Medical Services at the front has maintained its high reputation. During the operations the strain thrown upon all has been heavy, and the courage and devotion to duty displayed by the personnel on the battle-field has only been equalled by the zeal and energy of those in the field units. In this connection the valuable services rendered by the consulting surgeons and physicians demand special mention, whilst the thanks of the Army are due to the nursing sisters for their indefatigable services in tending the sick and wounded. These ladies have by their devoted work under difficult conditions of climate and surroundings set an example of which they may well be proud.

I should like further to express my thanks to those individuals and organisations which, though not strictly military, have rendered valuable services to the Army. Foremost among these I would mention the British Red Cross Society, which has worthily maintained its splendid record throughout this campaign. The sterling work performed by its personnel, and its bountiful provision of motor launches, motor ambulances, and gifts, have been the means of alleviating much suffering.

THE CONSTITUTION OF THE MEDICAL RECRUITING BOARDS.

A joint meeting of the Central Medical War Committee and the Committee of Reference of the English Royal Colleges was held on Wednesday last to consider the position of the medical profession in reference to the new arrangements which are announced to be made by the Government in respect of the medical recruiting boards. A review of the situation was put briefly before the meeting, which showed how anxiously the attention of the Committees had been already directed to the identical question of the constitution of these boards. In a prolonged discussion it was pointed out by more than one speaker that the medical profession as a whole was being subjected to unfair criticism at the hands of the public, which considered that medical men were in some way responsible for the constitution of the medical recruiting boards, whose procedure is now under Parliamentary inquiry by the Select Committee of the House of Commons investigating the subject of the medical examination of recruits in relation to the Military Service (Review of Exceptions) Act. The meeting unanimously decided that the present was the right and fitting time to approach the Government with regard to the reconstitution of those boards. The evidence of Lord Derby before the Select Committee, which was given on Tuesday last, met with the general approval of the meeting, the decision of the Government to commit the constitution of the boards to civilian hands being heartily welcomed, although the suggestion that the new authority should be the Local Government Board was viewed with marked apprehension. The joint meeting of the Committees, after discussion, passed the following resolution:—

That this joint meeting of the Committee of Reference and the Central Medical War Committee communicate at once to the Prime Minister, the Secretary of State for War, the President of the Local Government Board, and the Chairman of the Select Committee (Mr. Shortt) its view: (1) That in any reorganisation of the recruiting machinery of the country it is absolutely necessary that, as regards the medical examination of men, the selection of the doctors to serve on the medical boards throughout the country should not be left wholly in any local hands, but should be supervised by a central body in order to obtain adequate uniformity of standard; and (2) that the selection should be made under the auspices of these two bodies (the Committee of Reference and the Central Medical War Committee) jointly, who are preparing a scheme for this purpose, which they will have the honour of submitting to the Government for its consideration.

DENTISTS AND THE MILITARY SERVICE ACT.

On a previous occasion we drew attention to the position of registered dentists under the Military Service Act, and in the course of our remarks we pointed out how comparatively small was the number of registered dentists available for the civilian population, supporting the view that the further withdrawal of dental surgeons would be detrimental to the public well-being. Still further, we suggested that if qualified dentists were to be brought under the working of the Act they should be employed in their professional capacity rather than as combatants. This view, that there is a danger in reducing the number of registered dentists, would seem to be held by the Central Tribunal, for a decision recently made contained these words:—

The Central Tribunal, from evidence submitted to them, are impressed with the danger of further reducing the number of registered dentists now in this country. Whether any particular dentist should be granted exemption must obviously depend to some extent upon the requirements of the place in which he practises, but they are inclined to think that unless it be shown that his services are not required he should be granted exemption.

A Memorandum has now been issued by the Army Council which goes some way to regularise the position of registered dentists. Briefly, all applications for exemption are to be dealt with by the local tribunals. Should the tribunal decide that the claim for exemption is not substantiated, then, in the case of a man who was under 35 years of age on Jan. 1st, 1917, and who remained in category A, he should be available for military service; on the other hand, all those under 35 years of age, not fit for general service—that is to say, in categories lower than A—and all men of 35 and over will be exempted from military service provided that they place themselves at the disposal of a Dental Service Committee. This committee is to contain representatives of the British Dental Association, medical representatives, and representatives of Government departments, and we believe it is also to include a representative from the Central Medical War Committee. The duty of this committee will be to ascertain in what districts there is an urgent need for dentists under existing conditions, and to supply the needs of these districts with the help of those men who place themselves at the disposal of the committee. There is no question that the present arrangements, as detailed in the Memorandum, are a distinct step in advance. Considering the scarcity of qualified dentists, we are still of the opinion that every qualified dentist should continue to be employed in his professional capacity, if not among the civilian population then in the Army. If, however, the Army considers that there is an excess of dentists for the population, and that no more dental surgeons are required for the Army, then it would seem desirable that the class which, under the present Memorandum, are to be passed for service should be used in the R.A.M.C. It should be remembered that all these men hold a dental qualification, and that infers that they have gone through a certain amount of medical training. We therefore think that they would be more useful in some medical capacity than as combatants.

RED CROSS AUXILIARY HOSPITALS.—The annual report of the Red Cross auxiliary hospitals at home, which are maintained partly by War Office grants and partly by Red Cross and local contributions, has just been issued and deals with 982 hospitals as compared with 815 last year. The cost of maintenance of these hospitals was £1,997,404, the total cost amounting to £2,205,085. The grants of the War Office amounted to £1,530,144 and the voluntary contributions were £674,949. It should be noted that these figures take no account of voluntary services.

STUDENTS IN CAPTIVITY.—In THE LANCET of Sept. 30th, 1916, we briefly reported the proceedings of the first meeting of the Committee of the British Prisoners of War book scheme under which for nearly two years British prisoners of war interned in enemy or neutral countries have received books for educational purposes. A detailed account of the work published in the April number of *Khaki*, has been reprinted with the motto "*Captivorum animis dent libri libertatem.*" One gratifying feature of the work is the recognition by many professional bodies of the reading done or examinations passed by interned students; these include the Imperial College of Science and Technology, the Conjoint Examination Board in England, the Pharmaceutical Society of Great Britain, the Royal Institute of Public Health, and the Royal Sanitary Institute. Most of the Universities, too, have intimated their intention of adopting a similar course as regards their own students, and some have done so. Seven of the men interned at Ruhleben have already passed the London University Matriculation Examination. As to the future of the scheme, Mr. Alfred T. Davies, who is its

chairman and director and the author of the pamphlet, says that even though the prospect of peace draws nearer the scheme should be continued in full force in order that help may continue to be given to students after their release from internment. The pamphlet is a gratifying record of a useful piece of constructive work. Offers of help or requests for information should be sent to Mr. A. T. Davies, C.B., Board of Education, Whitehall.

NEW MILITARY HOSPITAL.—The Allies Hospital Benevolent Society are undertaking the maintenance of a hospital for men discharged from the Army maimed and crippled. The Manor House, Hampstead, which is surrounded by nine acres of picturesque grounds, has been selected for the new institution, which will accommodate 1000 men, to whom special treatment will be applied in order to fit them to take their places in the ranks of skilled labour. Subscriptions should be sent to the treasurer of the society, Sir George W. Truscott, 135–137, New Bond-street, W.

"OUR DAY" IN ULSTER IN 1916.—The financial statement just published shows that for "Our Day" (in aid of the British Red Cross and Order of St. John) £27,735 1*s.* 8*d.* were raised in Ulster in 1916; of this a sum of £2925 11*s.* 9*d.* was specially ear-marked for "Brigade Hospital, Etaples," "Hilden Convalescent Hospital," and "Red Cross." Of the remaining sum £24,809 9*s.* 11*d.*, about one-third—£8266—has been allocated by the London Joint War Committee as follows: To W.V. Hospital, Belfast, £3500; Hilden Convalescent Hospital, £3566; Strabane V.A.D. Hospital, £200; Ulster Workrooms, £600; and Belfast Motor Transport for Wounded, £400. In addition, and apart from "Our Day" collections, a sum of £1000 has been given by the London Conjoint War Committee to the Belfast Limbless Hospital.

NURSES AND THE WAR.—The Imperial Nurses Club, Ebury-street, S.W., opened under the patronage of Princess Beatrice in November of last year, is filling a useful place in providing a club and hostel for nurses, whose homes are far away, on their journeyings to and from France. The London nurse is also finding the club a convenient place of rest and social intercourse in her leisure hours, and the fact that over 300 members have joined in six months speaks for itself. It is hoped the club will eventually become self-supporting, but at the present moment there is urgent need of funds both to carry on the work and to enlarge its scope. For this purpose the vice-presidents of the club, who include the Lord Mayor and the Bishop of London, are making an appeal for £4000. The response to this appeal should be a ready one in view of the immense services rendered by nurses to the community during the past three years. Donations may be sent to either of the treasurers, Major W. McAdam Eccles, R.A.M.C. T., 124, Harley-street, W. 1, or Mr. R. Martin-Holland, C.B., Martin's Bank, 68, Lombard-street, E.C. 3, or to the honorary secretary of the club, Miss C. H. Mayers, 137, Ebury-street, London, S.W. 1.

THE MEDICAL EXAMINATION OF RECRUITS.—Colonel Galloway was recently asked before the Select Committee whether the recruit should be examined by one doctor only or by several in detail, stating his preference for the latter system. This is practised in the United States, and the *Military Surgeon* for June describes how 10,000 men were examined under the direction of Lieutenant-Colonel Jacob Frank, chief surgeon of the Illinois National Guard. The examination took place in the balcony round a hall, large enough for a whole battalion to fall in on the main floor to wait their turn. The examination was done by 16 medical officers, who were subdivided into two groups of eight. These eight medical officers, each with a clerk, did only one section of the examination. The man brought a card, with his name on it, to the first clerk. The first examiner weighed the man and took his height and chest measurements; the second tested the heart and lungs; the third examined the skin and nervous system; the fourth examined the impairment of bones and joints for flat-foot and other deformities of the parts, for hernia, varicocele, varicose veins, and hæmorrhoids; the fifth noted the condition of the nose and throat and also of the teeth; the sixth tested the vision and the seventh the hearing of the applicant; the eighth referred the doubtful cases to the supervising officer of the Army Medical Corps. 10 per cent. of those examined were rejected.

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Temp. Surg. F. T. Grey relinquishes his appointment on account of ill-health contracted in the service, and retains his rank.

To be temporary Surgeons: J. P. S. Walker, C. Colmer, W. S. Parsons, G. A. Clark, L. E. A. B. Farr, G. H. Ward, L. G. Higgins, A. G. Bee, A. M. MacGillivray.

ROYAL NAVAL VOLUNTEER RESERVE.

To be temporary Dental Surgeon: W. B. Parr.

ARMY MEDICAL SERVICE.

Temp. Col. J. W Bridges, Canadian A.M.C., to be Assistant Director of Medical Services.

Lieut.-Col. C. A. Peters, Canadian A.M.C., to be temporary Colonel whilst employed as Assistant Director of Medical Services.

Col. A. A. Sutton, C.B., D.S.O., to be temporary Surgeon-General.

ROYAL ARMY MEDICAL CORPS.

Major (temp. Lieut.-Col.) A. A. Meaden relinquishes his temporary rank on re-posting.

Major R. H. L. Cordner relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Temp. Major C. H. Dickson, Canadian A.M.C., to be temporary Lieutenant-Colonel and to command a Canadian Casualty Clearing Station.

Temp. Major E. F. Eliot to be acting Lieutenant-Colonel whilst on special employment.

Major E. V. Aylen, D.S.O., to be temporary Lieutenant-Colonel whilst commanding a R.A.M.C. Training Centre.

Temp. Major H. J. Shirley to be temporary Lieutenant-Colonel.

Major H. C. Sidgwick retains the acting rank of Lieutenant-Colonel whilst commanding a General Hospital.

To be acting Lieutenant-Colonels: Major G. E. Cathcart whilst in command of a Field Ambulance; Major A. B. Hinde, Reserve of Officers, whilst commanding a General Hospital; Major E. B. Booth, D.S.O., whilst in command of a Stationary Hospital, Major H. R. Bateman, D.S.O., whilst Commandant, Officers' Convalescent Home, Michelham; Capt. C. Clarke whilst in command of a Field Ambulance; Capt. L. Wood whilst in command of a Stationary Hospital.

To be temporary Majors: Temp. Capts. W. de M. Hill, H. Dickie, R. Nicholson, and W. Creighton, Canadian A.M.C.; Capt. (temp. Major) A. S. Williams, D.S.O.; W. C. Devereux; Lieut.-Col. W. T. F. Davies, D.S.O., South African M.C.

Capt. (acting Lieut.-Col.) J. W. Leitch to be Major and acting Lieutenant-Colonel.

Temp. Capt. W. B. MacDermott, Canadian A.M.C., is seconded for duty with the Anglo-Russian Red Cross Hospital without pay and allowances.

Temporary Lieutenants to be temporary Captains: R. McL. Wishart, H. M. Gillespie, A. E. Francis, H. R. Hurter, J. MacInnes, S. R. Hunter, A. E. Wynne, J. L. Smith, R. J. Morgan, A. Gaston, D. C. Crole, G. de H. Dawson, J. Whiteside, J. W. Watthews, A. J. Hawes, B. Robertson, A. Smith, W. Sowerby, R. M. Morison, J. R. M. MacKenzie, J. McD. Matheson, A. H. B. Pearce, A. Wright, E. W. Toulmin, W. B. Hendry, S. H. Scott, J. McPolin, D. Walker, J. Byrne, V. E. Sorapure, R. M. McMinn, H. W. Hues, H. H. Tipping, H. M. Sturrock, C. S. Clegg, R. L. S. Nuthall, D. Campbell, T. B. A. Haggard, A. Morrison, A. W. Adams, W. L. Thomas, M. Graves, F. E. Dowling, J. E. Finlay, A. F. Fraser, L. Bensted, F. C. Morgan, J. F. C. O'Donohoe, H. E. T. Dawes, S. G. Graham, A. J. Ireland, W. S. Foote, R. J. Snider, G. W. Armstrong, W. B. Rutherford, G. Scullard, P. W. M. Curry, M. J. Loughrey, J. H. Fryer, P. A. Dykes, D. N. Knox, T. J. Taunton, J. Graham, H. Whitwell, D. McCormack, C. J. B. Pasley, D. P. Blair, A. R. M. Brenan, J. Clark, D. H. Collingham, F. D. Saner, W. St. A. Hubbard, J. P. Mathie, J. A. B. Hammond, D. D. Pinnock, T. S. Law, J. B. Donaldson, G. D. Watkins, J. D. Doherty, J. M. Lazenby, R. R. Law, C. W. Brown, A. E. B. Sim, R. C. Alexander, A. G. McKenna, C. B. Goulden, W. S. I. Robertson, S. A. Bull, F. W. Falconer, R. Roberts, R. E. Sedgwick.

To be temporary Captains: J. Allan, J. Henderson, C. J. Heaton, A. E. Boycott, A. E. Moore.

W. C. McN. Dickey, late temporary Captain, to be Honorary Captain.

J. R. Taylor to be temporary Honorary Captain.

Temp. Hon. Lieuts E. W Twining and L. W. Sharp to be temporary Honorary Captains whilst employed at the British Red Cross Hospital, Netley.

To be temporary Lieutenants: L. S. Davison, A. Fleming, A. G. McIntyre, W. B. Primrose, B. S. Johnson, W. T. McCutcheon, E. MacM. Mahon, J. B. Cook, J. Grogono, E. W. Grogono, B. P. Harding, P. W. L. Camps, B. Kelly, T. A. Davidson, C. A. B. Horsford, E. W. Milne, T. Marron, W. E. Burrows, S. E. Holder, C. A. Lawrence, J. B. Banister, J. Ellenbogan, E. Morison, P. J. Hay, J. A. W. Ponton, J. C. Ryan, B. Suggit, F. H. Diggle, A. M. Malcolmson, A. Tait, M. S. Wood, A. R. Taylor, G. H. Hackney, O. Smith, J. Cross, R. C. Corbett, T. F. Murphy, C. H. G. Lyall, E. Morgan, C. Bernard, T. A. Davies, F. P. Nunneley, M. Dockrell, T. Kennedy, B. B. Phillips, C. B. Gerrard, C. B. M. Aldridge, R. N. Woodsend, J. McGibbon, R. T. A. Patchett, L. Wayne-Morgan, A. H. Gray, F. Crooks, A. MacMillan, H. Baird, V. J. Rigg, M. Aikman, P. L. Pollard, H. W. J. Hawthorn, W. Cook, R. S. Strachan, D. O. Fairweather, T. Fraser, C. Brash, R. Taylor, J. D. Oliver, J. A. Powell, J. N. M. Sutherland, A. Matheson, F. L. Thomas, J. W. A. Wilson, D. L. G. Radford, F. A. Morrison, D. P. Smith, P. A. Hendley, S. W. Swindells, A. Westerman, G. Eager, A. C. Farlinger, G. W. Bissett, H. F. Smith, E. G. D. Benson, G. Milne, J. W. Senter, C. M. Stevenson, U. Marks, T. B. Vaile, A. H. Duckett, J. J. Todd, D. W. Tacey, C. R. A. Thacker, W. Tudhope, H. R. Cran, R. N. Dunlop, J. G. Woolham, N. H. M. Burke, J. D. Hartley, J. D. Jones, P. Steele, G. Denholm, A. F. Waterhouse, M. D. MacKenzie, L. D. Callender, J. Dawson, H. C. Taylor, J. B. H. Holroyd, H. E. Middlebrooke, W. H. Parkinson, H. W. B. Ruxton, H. Maffin, T. Brodie, G. J. Langley, F. de R. Martyn, W. B. Peacock, R. R. H. Wormacott, A. O. Bisson, J. F. Lindsay, F. McG. Loughnane, C. Gray, A. Rogers, G. D. Dawson, H. A. Mason, J. Gilchrist, W. E. Procunier, H. H. Stiff, J. Orr, J. W.

McDougall, G. Mowat, D. R. C. Shepherd, C. L. Stewart, E. C. Roberts, H. F. Marshall, H. R. L. Allott, F. F. C. Willington, J. Good, R. C. Pitt, C. Visger, A. J. Adkins, W. H. Gibson, J. T. R. MacGill, D. Longwill, M. J. Macauley, G. Ligertwood, F. H. Mosse, D. P. McDonald, L. D. Wright, R. Fraser, E. J. Manning, C. J. Taylor, W. Duguid, St. G. M. L. Homan, C. W. C. Harvey, G. E. A. Mitchell, T. R. Couldrey, P. J. O'Brien, J. Fortune, J. F. MacLeod, A. F. Horn, I. B. Richardson, W. Deane, C. H. Gunson, W. B. A. Moore, S. G. Johnson, R. W. Dale, J. Maxwell, A. G. Brand, A. S. Findlay, J. A. Hagerty, H. P. Wright, F. D. Scott, W. H. Gowans, A. G. Stewart, J. W. Robertson, A. G. J. Thompson, G. Garland, M. P. Thomas, A. R. Jennings, H. Thorp.

R. Robillard, Canadian Army Dental Corps, to be temporary Lieutenant.

H. D. Havard to be temporary Honorary Lieutenant.

Officers relinquishing their commissions: Capt. A. G. Levy (on account of ill-health); Temp. Capts. D. A. Fletcher, G. W. Whitman, C. O. Walsh, G. M. Shaw, H. M. Godfrey, A. D. Sharp, G. B. Burwell, M.C., J. H. Box, J. F. Ryan, W. J. B. Brown, H. G. Murray, G. A. Greaves, R. E. Johnston, N. MacDonald, H. S. Moore, W. F. MacDonald, K. E. Millan, D. A. Fletcher, J. G. Sleeman, A. G. Howson, A. R. Thomson, C. D. Kean, K. G. McKeazie, A. G. C. Irvine (on account of ill-health); Temp. Lieuts. R. F. Williams, M.C., R. B. Robson, P. Nase, J. Barrett, H. W. Gush, R. J. Willson, A. McD. Nevin, J. A. Williams, L. E. Price, A. Dangerfield, J. R Heath, H. P. Motteram, J. H. Watson, B. J. Courtney, H. E. White, S. Verdon-Roe, I. W. Dickson, F. Kinnear, K. S. Macky, E. F. Hoare, G. A. Campbell.

SPECIAL RESERVE OF OFFICERS.

Major S. G. McAllum to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Capt. H. C. Sinderson relinquishes the rank of temporary Major on re-posting.

Lieutenants to be Captains: B. E. Jerwood, G. L. Maule, J. P. Macnamara, T. Parr, W. Bryars.

P. A. Stewart to be Lieutenant.

Major R. G. D. O'Callaghan relinquishes his commission on account of ill-health, and is granted the honorary rank of Major.

INDIAN MEDICAL SERVICE.

The King has approved the promotion of Lieut.-Col. C. R. M. Green to the rank of Colonel.

The King has also approved the grant of temporary rank of Lieutenant to Gulam Ali Miri, Dinkar Narayan Varde, George Albert Hildreth, Amrita Nath Banerji, Khanderao Krishnarao Dhairyawan, Jatindranath Mukerji, Jal Dinshawji Daruwalla, Kanayalal Narainbas Sonpar, Narayan Raghunath Satpute, Vasant Dinanath Madgavkar, Vinayak Raghunath Nagarkar, John Michael Guilfoyle, Ashutosh Das, Ranjit Sen, Manuel Miranda.

DEATHS IN THE SERVICES.

Inspector-General Robert Bantham, R.N., retired, recently at his residence in Ealing, at the age of 70 years. He received his medical education at University College, London, and qualified by taking the L.R.C.P., L.R.C.S. Edin., in 1868. Entering the Navy in 1874, he became staff-surgeon in 1886, and when serving in that capacity in the *Cordelia* on the Australian station he received the expression of the Admiralty Lords' satisfaction at receiving the very favourable report of his professional services on the occasion of the bursting of a 6-inch gun on board that ship when at sea. He became fleet-surgeon in 1894, and was sent out to take medical charge of the Gambia expedition. As deputy inspector-general he was in charge of Plymouth Hospital from 1902–04, and then proceeded to Malta to take charge of the hospital and medical establishment there, and again receiving the congratulations of the Admiralty for his treatment of cases of Mediterranean fever. He retired from the service in 1907, but continued his professional activities, associating himself with the West London Hospital.

NAVAL MEDICAL COMPASSIONATE FUND.

At the quarterly meeting of the Directors of the Naval Medical Compassionate Fund, held on July 17th, Surg.-Gen. W. H. Norman, C.B., Medical Director-General of the Navy, in the chair, the sum of £45 was distributed among the several applicants.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

The first and longest communication in the June issue of the *Journal of the Royal Army Medical Corps* deals with a new method of preparation of a vaccine against bacillary dysentery which abolishes severe local reaction, by Captain H. Graeme Gibson. The communication also records the results of experiments with this vaccine on animals and man. The experiments appear to show that prophylactic inoculation against bacillary dysentery has some chance of success, and the "vaccine having passed the laboratory tests to satisfaction now passes on to the final experiment, that of trial in the field, which is taking place at the present time." The Diagnosis and Treatment of Malarial Fever is the subject of an illustrated article by Captain David Thomson, who describes, on the suggestion of Lieutenant-Colonel Sir Ronald Ross, some extensive and careful researches carried out at the Liverpool School of Tropical Medicine and elsewhere for a continuous period of nearly four years. The joint serial article by Lieutenant-Colonel C. M. Wenyon and Captain F. W. O'Connor on problems affecting the spread and incidence of intestinal protozoal infections is continued, and Dr. T. E. Harwood, resident ophthalmic officer at King George's Hospital, interestingly discusses functional conditions in the light of head injuries, the subject being already familiar to our readers through the articles by the same author which appeared in our columns of Sept. 2nd and Dec. 16th, 1916, pp. 431 and 1014 respectively, and March 24th, 1917, p. 452.

PLYMPTON (DEVON) V.A.D. HOSPITAL.—On July 9th Countess Fortescue formally opened a new wing, containing 20 beds, which has been added to the Plympton V.A.D. Hospital. It was stated that the Devon County Red Cross Society has now 36 V.A. hospitals containing 3140 beds.

Obituary.

JAMES TODD BALLANTYNE, M.B., C.M. GLASG.

Dr. J. T. Ballantyne, who recently died at the age of 72 years, had long been a familiar figure in the public life of Darwen. A native of Blantyre, near Glasgow, he qualified M.B., C.M. at Glasgow University in 1878, and settled in Darwen very shortly after. Of his work there "W. M." writes:—

For many years Dr. Ballantyne was the President of the Darwen Medical Society, and since the death of Dr. John Wraith he was the *doyen* of the medical profession in the town. In the work of the society he was a regular attendant at the meetings, took a keen interest in all scientific questions, was ever ready to further the welfare of the society, and regarded it as his special duty to promote good-fellowship among the members. He had great diversity of tastes; his love of art, music, and his fondness of travel made him a delightful fellow to meet, or spend an evening with.

In his public and private work he was one of the most fearless of men, and was at all times strongly opposed to any suggestion savouring of inefficiency or humbug. He could sing a good song, tell a good story, and appeared at his best giving the "oration" at a Burns dinner. A huge man in build, he had a correspondingly large heart. He was always kind and sympathetic towards suffering humanity, giving largely and in the main silently. Darwen owes to him a deep debt of gratitude after a strenuous life of nearly 40 years spent in the public interest in the town of his adoption.

Medical News.

UNIVERSITY OF LONDON.—At examinations for internal and external students held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Mirza Mohammed Khan, University College Hospital; Helen Marion Macpherson Mackay, London School of Medicine for Women; Donald John Munro, Guy's Hospital; and Margaret Russell Paterson, London School of Medicine for Women.

Branch IV., Midwifery and Diseases of Women.—Charlotte Leighton Houlton and Hilda Mary Scarborough, London School of Medicine for Women.

M.S. EXAMINATION.

Branch I., Surgery.—Cecil Banting, University College Hospital.

SECOND EXAMINATION FOR MEDICAL DEGREES, PART II.

Kathleen Ardell, Ella Marianne Britten, and Joan Katherine Somerville Cave, London School of Medicine for Women; Saul Cohen, Guy's Hospital; Alison Margaret Collie and Florence Edith Coombes, London School of Medicine for Women; Egbert Aubrey Lennox Crichlow, King's College; José Joaquim da Gama Machado, St. Bartholomew's Hospital; Sarah Helen Davies, London School of Medicine for Women; John Joseph Philip de Chaumont, King's College; *Kathleen Field, London School of Medicine for Women; Isaac Frost, King's College; Edward Gallop, St. Bartholomew's Hospital; Jean Stephanie Hall and Eleanor Harse, London School of Medicine for Women; Cecil Edward Eede Herington and Reginald Walter Patrick Hosford, St. Bartholomew's Hospital; Arthur St. George Joseph McCarthy Huggett, St. Thomas's Hospital; Morris Korn, London Hospital; Henri Toussaint Levieux, Guy's Hospital; Gwendolen Winifred Tryner Lynn, London School of Medicine for Women; Syed Francis Mahmood, University College, Cardiff, and St. Bartholomew's Hospital; Aziz Abd el Sayed Mansour, King's College; Norman August Marais Petersen, London Hospital; George Stuart Bain Philip, King's College and Charing Cross Hospital; Reginald Ernest Pleasance, University of Sheffield; Cyril Mayberry Probert, University College, Cardiff; Hilda Winifred Richards, London School of Medicine for Women; William Arthur Richards, University College, Cardiff, and King's College; Herbert Leyland Sackett, St. Bartholomew's Hospital; Katherine Jane Shaw, London School of Medicine for Women; William Arthur Merrett Smart, London Hospital; Sonia Strashun, London School of Medicine for Women; Kathleen Annie Harvey Sykes, University of Liverpool; Berian Melbourne Gwynne Thomas; University College, Cardiff; Raphael Thursz, King's College; Kathleen Mary Tillyard, University of Cambridge; Ruth Catherine Townshend, London School of Medicine for Women; Noël Sydney Bailey Vinter, St. Bartholomew's Hospital; Dorothea Compston Wigfield, London School of Medicine for Women; Kathleen Mary Wilkinson, University of Birmingham; Idwal Glynne Williams, St. Bartholomew's Hospital; and Lucy Wills and Grace Elizabeth Winn, London School of Medicine for Women.

* Distinguished in Pharmacology.

N.B.—These lists, published for the convenience of candidates, are issued subject to their approval by the Senate.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated:—

Surgery.—H. N. Dale-Richards (Section II.), St. Mary's Hospital; L. E. A. B. Farr (Sections I. and II.), Cambridge and King's College Hospital; B. Ramirez (Section II.), Guy's Hospital; and W. Stansfield (Sections I. and II.), Manchester.

Medicine.—C. W. Bower (Section I.), St. Bartholomew's Hospital; D. C. Clark (Section I.), King's College Hospital; H. N. Dale

Richards (Section II.), St. Mary's Hospital; R. W. Diggett (Section I.), Jefferson College, Philadelphia; S. G. Mahomed (Sections I. and II.), Liverpool; E. J. G. Sargent (Section I.), St. Bartholomew's Hospital; G. R. Sharp (Section I.), London Hospital; and P. V. Wynn-Werninck (Sections I. and II.), St. George's Hospital.

Forensic Medicine.—C. W. Bower, St. Bartholomew's Hospital; E. A. Leak, Cambridge and London Hospital; A. Magill, Guy's Hospital; S. G. Mahomed, Liverpool; and G. W. Pratt, Cambridge.

Midwifery.—A. E. Collie, Middlesex Hospital; and G. W. Pratt, Cambridge.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—H. N. Dale-Richards, L. E. A. B. Farr, G. W. Pratt, B. Ramirez, and W. Stansfield.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

Francis Joseph Devlin, Robert Arthur Jones, Noah Morris, and Robert Stuart Rodger.

UNIVERSITY OF GLASGOW.—The following candidates received their degrees on July 21st:—

Bachelors of Medicine and Bachelors of Surgery (M.B., Ch.B.).—With Honours: Jules Steinmetz Martin and John Marshall. With Commendation: Robert Aitken. Ordinary Degrees: William Adams, Janetta Margaret Alexander, John Ashforth, Alexander Basil Austin, Donald Campbell Buchanan, John Salisbury Craig, William Dempster, Michael Devera, Kenneth Henry Dyke, James Paton Fleming, Thomas Fleming, Thomas Forrest, Walter Watson Forsyth, Robert John Leslie Fraser, Jean Mary Frew, George Keith Fulton, Peter Fife Auchinachie Grant, Grace Leisk Hunter, Edward Porteous Irving, Jacob Joels, William Fulton Kivlichan, Mary Reid Knight, Andrew Brown M'Aulay Lang, George Lean, Neil Mackillop, Donald James Mackinnon, Robina Stuart Mackinnon, Jessie Brown Maclachlan, Lilias Maclay, William M'William, David Stephen Mitchell, James Moffat, George Pearson, Humphrey Robertson, John Joseph Robertson, John Llewellyn Rowlands, Frank Watt Sandeman, James Hamilton Shearer, and Douglas Taylor.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently the following candidates were successful:—

SECOND EXAMINATION.

John Murray.

Anatomy.—John Lister Radcliffe Ross.

Physiology.—Robert Charles Dow, Arthur William Hodder Noble, John Rorrison McCubbing, and Sayed Chaleb.

THIRD EXAMINATION.

Robert Berry Forgan, Thomas Richard O'Keeffe, Donald MacLeod Jacob Wolf Robkin, and Richard Gordon Bell.

Pathology.—Mayberry Hugh Carleton.

Materia Medica.—Lizzie Robertson Clark, Thomas Arnoldus du Toit, George Coote Field, Lawson Lamb Steele, John Thomas Whicker Gale, and Jacob Johannes van N'ekerk.

FINAL EXAMINATION.

John Forbes Campbell, James Henry Brown, Frank Moffat Haldane Sanderson, William Ulic Desmond Longford, Hugh Emile Colman Collins, Donald McGregor Stewart, Mung Sun Loh, Allen Gordon Bee, Frank Jones, Eliza Jean Stuart, Daniel Colin McNair, and Clarence James Middleton.

Medicine.—Indranarayan Borrah, George Patrick de Silva, and Christopher Robert Cecil Moon.

Surgery.—Iwan Davies.

Midwifery.—Bernard Malachy Lynam, and George Patrick de Silva.

Medical Jurisprudence.—Iwan Davies, Joseph Davison Begley, John Alfred Alexander Duncan, Alan Herbert Brooke Hudson, Arthur Stanley Hughes, Rebecca Goodman, Hassan Amin Madwar, Quintin Stewart, and Cuthbert Caulter Magee.

LONDON HOSPITAL MEDICAL COLLEGE.—The following awards have been made to students of the London Hospital Medical College during the session 1916-17:—

Price and entrance scholarships in Science (1) £100, R. A. Madgwick; (2) £50, D. Hunter; Buxton entrance scholarships in Arts, £31 10s., C. E. Fenton; prize in Clinical Surgery, £22), G. Adler and H. Gluckman (equal, prize divided); prize in Clinical Obstetrics and Gynæcology, £20, F. W. A. Watt; Duckworth Nelson prize in Practical Medicine and Surgery, £10, D. J. Valentine; Sutton prize in Pathology, £20, I. H. Zortman; Wynne Baxter prize in Forensic Medicine, £5 5s., G. R. Woodhead; Anderson prizes in Elementary Clinical Medicine, value £3 each, A. E. Clark-Kennedy and M. Marcus; honorary certificates, D. Wallice, J. M. Winnett, and I. J. Cruchley; prizes in Elementary Clinical Surgery, value £5 each, J. C. Collins, J. Brodetsky, I. J. Cruchley and A. Eidinow (equal, prize divided), and M. W. B. Bulman; prize in Minor Surgery, £5, F. H. W. Tozer; honorary certificates, D. Hunter and D. R. Thompson; prize in Anatomy and Physiology, value £25, M. Marcus; prize in Practical Anatomy, value £6, E. L. Sergeant; honorary certificates in Inorganic Chemistry, M. Remy and F. C. Hunt.

Owing to circumstances arising out of the war there were no candidates for the Price entrance scholarship in Anatomy and Physiology open to students of the Universities of Oxford and Cambridge, the entrance scholarship in Science open to students of Epsom College, the Hutchinson prize in Clinical Surgery, and the Liddle prize. The prize in Clinical Medicine, one of the Anderson prizes, the second prize in Practical Anatomy, and the Letheby prizes in Chemistry were not awarded. The Arnold Thompson prize was not offered for competition.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Military Service (Review of Exceptions) Act.

THE Select Committee of the House of Commons which is investigating the subject of the medical examination and re-examination of recruits for the Army, particularly in relation to the Military Service (Review of Exceptions) Act, continues to hear evidence. Mr. SHORTT is chairman of the Committee.

On Monday, July 16th, brief evidence was given by Surgeon-General Sir G. D. BOURKE, of the Aldershot Command. He stated that he had nothing whatever to do with the medical examination of recruits except so far as a portion of the Royal Flying Corps was concerned. He had no complaints about men who had been passed in the various categories for it.

Colonel PETERKIN, D.D.M.S. in the London District, also gave evidence. He stated that on Sept. 16th, 1916, a letter was addressed to him from Whitehall, in which it was stated that rejections continued to pour in every day in large numbers. It proceeded—

"Will you please issue orders to your medical boards at once so that they may not totally reject any man who can perform any kind of work. Sedentary work does not necessarily mean clerical work. Any man who can earn a livelihood in civil life can do something for the Army. Please stop it at once and give very definite orders to your boards."

As a result of this letter Colonel Peterkin had sent out a circular letter on the subject, pointing out that many of the men who were rejected were fit for C 3.

"Cases of medical rejection, therefore, must be brought down to the very lowest proportions," the letter proceeded. "Some of our boards have as much as over 40 per cent. of rejections. That, in my opinion, is much too high and is difficult to understand."

The acting CHAIRMAN (Mr. MOONEY) then submitted a return relating to the permanent rejections in the London District. It was in the following terms:—

—	Before the circular was issued.	Fortnight after circular was issued.	—	Before the circular was issued.	Fortnight after circular was issued.
	Per cent.	Per cent.		Per cent.	Per cent.
Whitehall (1) ...	20·4	4·6	Stratford (1) ...	9·4	4·9
,, (2) ...	28·4	9·9	,, (2) ...	17·1	6·5
,, (3) ...	17·3	6·8	Shoreditch ...	21·5	7·0
White City (1)	31·4	12·8	Chelsea	43·6	3·1
,, (2)	32·7	15·9	Holborn	28·1	7·7
			Battersea ...	28·8	9·5
Camberwell (1)	26·2	23·6	St. Pancras ...	38·4	8·9
,, (2)	21·9	18·2	Woolwich ...	28·8	9·8

Mr. PRINGLE referred to the Army Council Order issued in 1916, which called attention to the discharge of men as unfit shortly after enlistment, and stated that this could be avoided if medical examinations were more carefully carried out. He asked whether the witness did not think that the passage in his circular stating that cases of medical rejection must be brought down to the very lowest proportion would not be likely to lead to an increase in the men who were improperly accepted.

Colonel PETERKIN: No; I think the suggestion in the circular was to make them C 3 men. He agreed with the statement that any man who could earn a livelihood in civil life could do something for the Army. Whatever a man did in civil life, he would not pass him with serious heart disease into the Army. Instructions to medical boards must, of course, be interpreted in the light of common-sense. He did not admit that men were taken into the Army who ought not to have been accepted, but allowance had always to be made for cases of errors, which would occur.

On Tuesday, July 17th, evidence was given by Mr. HART, clerk to the Middlesex Appeal Tribunal, who spoke of complaints in regard to the Mill Hill Medical Board. The War Office, on being approached in this matter, stated that the board consisted of doctors who were specially chosen for this work, and that their decisions might be accepted with confidence. Going on to speak of medical boards in his area generally, witness said that examinations began to be most unsatisfactory about the middle of 1916. The discourtesy of boards perhaps only applied to some 20 cases. There had lately been an improvement.

Mr. DONALD MACLEAN, M.P., chairman of the Appeal Tribunal sitting at the House of Commons, stated that in 625 cases which had been sent by London tribunals for re-examination there had been no alteration in 162 cases, and in 84 cases the classification was raised. In 318 it was

lowered and in 61 cases rejection had taken place. He was strongly in favour of an extension of special medical boards to which appeals could be brought.

On Thursday, July 19th, Lieutenant-General Sir JAMES WOLFE MURRAY, General Officer Commanding-in-chief of the Eastern Command, gave evidence. He could not say that any complaints had been brought direct to his notice from the public as to the manner in which medical examinations had been carried out. Complaints in regard to Mill Hill Medical Board which had appeared in the press had been brought to his notice. Inquiry was made into them, and the investigating officers were of opinion that the Mill Hill board was doing its work particularly well and exercising more discretion than was the case in regard possibly to some other boards. He was a member of the Army Council in July, 1915, and he had not heard of the letter sent round by Sir ALFRED KEOGH at that time. He could not say that he had ever heard from the War Office that an insufficient number of men was being passed for garrison service abroad. When a Ministerial pledge was given in the House of Commons in regard to the examination or re-examination of recruits he supposed that the Minister who gave the pledge would see the particular member of the Army Council whose particular department was affected, and would instruct him to see that effect was given to it. The Army Council would then issue an instruction upon it. It would go out to the various commands in the form of an Army Council instruction. In August, 1916, his attention had been called by the War Office to the fact that during the previous seven or eight months 800 men had had to be discharged as unfit in the Eastern Command after having been passed as fit by medical boards, but he had replied that these represented only 0·5 per cent. of the recruits who had been passed in that time. He had also stated that if medical boards were subjected to too severe criticism there would be a danger that they would secure too few recruits.

Mr. PRINGLE: Were you not aware that about that time instructions were being issued to medical boards to pass more men into the Army and stating that there was a ridiculous number of rejections?

Lieutenant-General MURRAY: No. He had gained the impression in January or February of this year that there were too many men in the Army who ought not to be there. He had formed this impression particularly by the inspection of labour units.

On Monday, July 23rd, evidence was given by Sir JAMES MACKENZIE. He said that he had some experience on the Special Medical Board. His general impression was that difficulties were bound to arise in recruiting owing to the extent to which this country had been compelled to undertake it. Before the war Army medical officers examining recruits had to deal with fit men who wanted to enlist in the Army. They had never been trained to decide on questions whether a man in impaired health was fit to do a particular sort of work. The general medical practitioner had a training which rendered him more capable in the placing of men in the various categories. He went on to speak of the question of murmurs of the heart. A murmur of this kind might be innocent or it might be serious, but in this matter the military methods of examination and the life insurance methods had been stereotyped for practically 50 years. In 1915 he drafted a Memorandum as to heart murmurs and gave it to Sir Alfred Keogh, who circulated it. It was possible with fair certainty to distinguish between a murmur which indicated a serious state of health and one which was innocent. He believed that power of distinction could be easily acquired by a general practitioner.

The CHAIRMAN: Are men with serious murmurs not in grave danger of being mistaken for men with innocent murmurs?

Sir JAMES MACKENZIE: That should not be.

The CHAIRMAN: Not by general practitioners?

Sir JAMES MACKENZIE: Yes, there is the danger.

Mr. NIELD put to witness the point whether there should not be an increase in the number of appeal medical boards.

Sir JAMES MACKENZIE was of opinion that there had been confusion in this matter. There should be an inquiry by competent medical men into it. In his view in the work of the medical boards there had been a degree of error on the acceptance side as well as on the rejection side. He said that an instruction to pass men into categories on the supposition that they would be fitted for them after four months was foolish and impossible. No medical man could do it.

Dr. A. BENTHALL, who has been a member of the Mill Hill Medical Board, was the next witness. He spoke of the situation of the board and of the amount of work which it was called upon to accomplish. He said that the usual number of men examined in a day by the board at first was 300. That was far too high, and in May a second board had been set up and the number of recruits examined by each had been reduced to 150 a day. At Mill Hill he considered that the board had been overworked and that would probably account for any mistakes that had been made. One president classified 230 men in a time that gave a minute and a quarter for each one. There had been nine presidents in 12 months, and he thought that they had been overworked.

In reply to Mr. NIELD, Dr. BENTHALL said that he had heard that re-examinations from Mill Hill had often resulted in material alterations in the classifications. Mill Hill was doing better now, and this, he admitted, might be the result of the criticisms of the Middlesex Appeal Tribunal.

Dr. C. HAYWARD, Liverpool, gave evidence of his experience with regard to medical boards. He thought that civilian medical men had been misrepresented in the eyes of the public for giving classifications which had been arrived at by military medical officers as presidents of boards. The civilians resented very much not being brought into closer consultation with presidents in the determination of the categories of the men. He was under the impression that presidents had acted under orders to pass men through for the Army.

Transfer of Medical Examinations to Civil Authority.

On Tuesday, July 24th, the Earl of DERBY, Secretary for War, was the principal witness.

The CHAIRMAN (Mr. SHORTT), addressing him, said: On Thursday last the Committee passed the following resolution:—

> That the Chairman be authorised to inform the Prime Minister that the Committee are of opinion, in view of the evidence already taken, that a change of system should be made at once, and recommend that the whole organisation of recruiting medical boards and of the medical examinations and re-examinations should be transferred from the War Office to the Local Government Board.
>
> That the Committee are of opinion that in order to restore public confidence this change should be made at the earliest possible moment, and be not delayed until the Committee present their full report in accordance with their terms of reference.

That resolution, I believe, has been communicated to you.

Lord DERBY: Yes. I accept that resolution with both my hands, but I do not think that in its present abbreviated form it would work very satisfactorily. I want you to go outside the terms of your reference if you can and go very much further. I want you to recommend that the whole of the recruiting from A to Z should be taken out of the hands of the War Office and of the military authorities and be entrusted to a civilian department. I am certain that it is the course to pursue to take the whole of recruiting out of military hands and put it into civilian hands. Without touching except in a general sense on the evidence put before you, I recognise absolutely that there are certain things which must be remedied. Your resolution to a certain extent would remedy them, but if I may say so you are not healing the whole of the wound. You ought to make it a condition that a civilian authority finds the men, and that it is only after they have gone through the various processes of sifting, and it has been ascertained that they are fit for the various categories of service which the Army requires, then and then only should the Army get them. ..... General Geddes has told me that he believes it would be perfectly possible to transfer the whole of recruiting from a military to a civilian basis. I do not say for one minute that there will not be some of the men now employed on the military side as a part of the military recruiting machine who should not be employed by the new organisation. I do not want the change if it is to be a sham. These men, if they are to be employed, should go as civilians. They will have to take off the khaki and put on the black coat.

The CHAIRMAN: Has what you have told us got the approval of the Prime Minister?

Lord DERBY: He told me of the general view that a change was wanted. I told him the general idea. I told him what I should propose and he said "All right." I said, if the Committee ask me my opinion I shall say that we should go further than merely changing the system of medical boards to the Local Government Board. I put this forward as Secretary of State for War. I know that I am supported by the Adjutant-General and the Director-General of Recruiting. If this is done I should do my best to carry it through.

The CHAIRMAN: Do you put this forward as a policy which you as Secretary of State are prepared to accept?

Lord DERBY: Yes.

The CHAIRMAN: And, so far as you are able, you will get the War Cabinet and the Prime Minister to accept it also?

Lord DERBY: Certainly. He went on to say that General Geddes thought the transfer could be carried through in two months.

The CHAIRMAN: While this is being carried out are you prepared to give instructions that the civilians are not to be overridden by the military presidents on the boards?

Lord DERBY: Yes.

The CHAIRMAN said that the Committee had a very large body of admissions with regard to secret instructions sent out to the presidents.

Lord DERBY: Believe me that I will do anything in the world to stop the taking into the Army of men who are unfit for it. I have had enough military experience to know that they are the very worst bargain possible for the Army. He added that he did not know of secret instructions, but he

would let the Committee know beforehand the Army instructions which he proposed to send out.

Mr. PRINGLE: Are we to understand that a Government decision has been taken to carry out this scheme?

Lord DERBY: No. I am speaking as the head of a department and stating what my views are, and stating what I should be prepared to do if I got the necessary permission.

Mr. PRINGLE: Under your scheme who will issue instructions to the medical examining boards.

Lord DERBY: Civilians. The Army would have nothing to do with a man until he is handed over to be made a soldier.

Mr. PRINGLE: The Army would lay down the categories.

Lord DERBY: The Army would lay down that there are certain categories for which the men are wanted.

Mr. PRINGLE: Who will lay down the instructions for the purpose of interpreting these categories?

Lord DERBY: I take it, the civilian authorities.

The CHAIRMAN: I suppose the scheme will be laid before us for our recommendations.

Lord DERBY: Certainly.

General JULIAN, of the Western Command, gave brief evidence in which he said that he did not attach blame to medical boards for the way in which their work had been done. Men had to be passed in low categories, and it had to be remembered that it did not follow that because a man was fit for the Army he was fit to be a soldier.

Dr. D. WALSH was the third witness. He was of opinion that the certificates of medical men ought to be treated with respect by medical boards. Whether they were right or wrong they expressed the opinion of the doctor who gave them. It was not wise to name a man's category on the basis of what he was likely to be after four months' training. He particularly emphasised the necessity of careful examination in order to prevent the passing of men suffering from tuberculosis. In order to detect slight cases of tuberculosis an examination lasting 15 or 20 minutes at least was required. An advanced case, of course, was more easy to detect, but an early case was of an entirely different nature. He did not think any medical board could do justice to the individual or the taxpayer unless it contained some member skilled in the investigation of tuberculosis. If there was anything suspicious the man ought to be sent to a board of experts for examination, whether for the heart or for the lungs. Both required expert examination.

Promotion in the Royal Army Medical Corps (T.F.).

When the Committee on the promotion of officers in the Special Reserve, new armies, and Territorial Force was appointed it was stated that its inquiries would cover promotions in the R.A.M.C. Territorial Force. In its report the Committee states:—

> The question of promotion in the Royal Army Medical Corps (T.F.) has been brought to our notice. This matter will require further consideration, and bearing in mind the urgency of the measures we now recommend we have decided that the present report should no longer be delayed, and we propose to make a separate report on this subject at a later date.

HOUSE OF COMMONS.

WEDNESDAY, JULY 18TH.

R.A.M.C. Officers and Medical Certificates.

Mr. HOGGE asked the Under Secretary for War whether his attention had been called to the practice of the War Office which forbade *à la suite* officers to give a certificate as to the physical condition of any man likely to be brought before a tribunal; whether this prevented men getting medical certificates from their own medical men; and whether he would take steps to have this injustice removed.—Mr. MACPHERSON answered: There is no objection to such officers furnishing statements as to the physical condition of individuals for the information of medical boards to assist them in forming an opinion.

Mr. PRINGLE: Is it not the case that the Army Council instructions forbid any R.A.M.C. officer giving a certificate regarding a man's illness?—Mr. MACPHERSON: I believe that is so.

Mr. PRINGLE: Will the honourable gentleman not see that the opinion is available to the board when the R.A.M.C. officer in civil practice has been in medical attendance on the man affected?—Mr. MACPHERSON: My personal view is that the request is a reasonable one, and I will call the attention of the Department to it.

THURSDAY, JULY 19TH.

Royal Army Medical Corps (T.F.).

Mr. T. E. HARVEY asked the Under Secretary for War whether, in view of the good work which had been done and was being done at the front by the Territorial Force Royal Army Medical Corps, steps would be taken to prevent the merging of this force in the Regular Royal Army Medical Corps.—Mr. MACPHERSON answered: The administration of the Army has necessitated in some cases the absorption of regular personnel into certain Territorial Force units and *vice versâ*. Territorial personnel as such actually consists of men who have been or are enlisted on a Territorial Force attestation. No distinction can be drawn between the good work done from whatever source the units may have been drawn.

Mr. E. HARVEY: Is it intended to maintain the separate existence of the Territorial Force Royal Army Medical Service?—Mr. MACPHERSON: I think that point has been made clear in my answer.

Sickness amongst Carriers in East Africa.

Mr. MOLTENO asked the Under Secretary for War whether he could give any information as to the causes of and the numbers of the sickness casualties among native carriers in East Africa, which were stated to have reached a monthly average of between 10,000 and 15,000.—Mr. MACPHERSON said in reply: The principal causes of sickness among the carriers in East Africa are malaria, pneumonia, cerebro-spinal fever, and dysentery. I understand that 52 medical officers have been posted to carriers' hospitals, and that more are arriving shortly and will be posted as soon as they arrive. Missionary help from South Africa is also being obtained.

MONDAY, JULY 23RD.

Medical Board of the India Office.

In answer to Sir W. COLLINS, who asked what were the powers and duties and who were the members of the Medical Board of the India Office, Mr. MONTAGU (Secretary for India) wrote: The duties of the India Office Medical Board are to report on the medical fitness or unfitness of such members of the Indian services or candidates for appointment to the Indian services as the Secretary of State requires to come before the Board for examination. The Board is at present composed of Surgeon-General Sir Havelock Charles, G.C.V.O., I.M.S. (retired), president, and Lieutenant-Colonel J. Anderson, C.I.E., I.M.S. (retired).

Sick and Wounded on the Indian Frontier.

Mr. JOYNSON-HICKS asked the Secretary for India what was the number of men now engaged in frontier warfare in India; what were the casualties for the last 12 months, and what was the number of sick; and whether he could assure the House that the arrangements for the latter were satisfactory.—Mr. PRATT (one of the Junior Lords of the Treasury) replied: No frontier warfare is now in progress. The force recently employed in connexion with the operations against the Mahsuds amounted to four brigades and some attached units. The late Secretary of State made particular inquiry as to the medical and sanitary arrangements for the force and was assured that all possible steps had been taken. During the operations Dr. Lankaster, a distinguished member of the Church Missionary Society on the North-West Frontier, was deputed to make an independent examination, and the Government of India telegraphed that his report showed that the conditions and accommodation were satisfactory. The number of killed, wounded, and missing of all ranks in all the frontier operations during the last 12 months is 501. The Secretary of State has not yet received the returns of sickness.

TUESDAY, JULY 24TH.

Treatment of Neurasthenic Soldiers.

Mr. BARNES (Minister of Pensions), replying to Mr. STEWART, said that, recognising the special difficulties presented by neurasthenia and shell shock in invalided soldiers, a special medical board was empowered to deal with all such cases, and award pensions or gratuities in them. This board had set up branch boards in Scotland and Ireland, and members of it had been visiting at intervals over 14 towns for the purpose of examining men reported to them. Cases of neurasthenia and shell shock which were invalided out of the service before the special board was instituted were entitled to be re-examined by the board at all times, and local War Pension Committees had been specially instructed by circular to report to the board with a view to the re-examination of any case which, in their opinion, was not being properly treated. All cases of men invalided for shell shock were granted either pensions or gratuities in less serious cases, but in either event they were entitled to treatment or training under Article 6 of the Royal Warrant. He had given special attention to these cases. Provision had been made for their treatment at Golder's Green, London, where training and practice in intensive culture was being provided. The accommodation was about to be increased by 50 beds, and other suitable accommodation was being sought in the neighbourhood of London. A hospital for 50 was opened on Saturday at Belfast, and at Leeds and Leicester beds for 100 each were being provided. Men also were sent to recuperative work on farms in Essex.

Volunteer Field Ambulances.

Sir W. COLLINS asked the Under Secretary for War what progress had been made with the organisation of the volunteer field ambulances, and whether any appointments had yet been made to field ambulances in the County of London.—Mr. MACPHERSON wrote in reply: Substantial progress has been made with the scheme and a number of field

ambulances are in process of formation. London has not so far been asked to raise any ambulances, and I am not at present in a position to say anything definite as to London. I will write to my honourable friend and give him fuller information privately.

The British Red Cross and Mesopotamia.

Sir W. COLLINS asked the Secretary for India what replies were sent to telegraphic offers by the British Red Cross Society in September and December, 1915, to supply motor ambulance transport and other medical and surgical necessaries for the troops engaged on the Mesopotamia front.—Mr. MONTAGU wrote in reply: The following telegraphic correspondence passed in July, August, and December, 1915, regarding the supply of medical equipment for Mesopotamia by the British Red Cross Society. So far as I am aware no telegrams were sent in September, 1915, on this subject. On July 17th, 1915, Sir William Garstin, Director of the Stores of the Joint War Committee of the British Red Cross Society and the Order of St. John, sent the following cable to Sir John Nixon:—

Can British Red Cross help in any way with hospital supplies for your force? Will gladly do anything we can in sending gifts if you will let me know what you require.

To which the following reply was received on July 23rd, 1915:—

Many thanks your kind offer. Would most appreciate two good open motor launches for hospital work. If sent by first available boat would be invaluable.

On August 5th Sir William Garstin cabled to Sir John Nixon advising him that one motor launch was leaving on August 7th, and on August 12th cabled as follows:—

Second motor launch leaving 14th August. Do you require skippers? Are you in need of any other stores?

On August 15th the following cable was received from Sir John Nixon:—

Greatly indebted for valuable gift of two launches. Many thanks for offer of engineers, but men are available here. May I wire requirements of other stores later if needed?

On the next day Sir William Garstin cabled:—

Please wire requirements of stores when needed.

On Dec. 16th, 1915, Sir William Garstin cabled to Sir John Nixon as follows:—

Can Red Cross help in any way towards providing comforts, garments, or surgical necessities for your sick and wounded? Will be glad to help in any way you indicate, and will arrange to send out anything you may require by first steamer sailing for Basra.

Sir John Nixon replied on the 28th as follows:—

Many thanks your wire of 16th. Nothing required at present. If anything needed in future will not hesitate to ask you.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRKENHEAD BOROUGH HOSPITAL.—House Surgeon. Salary £250 per annum and war bonus, board, &c.

BIRMINGHAM GENERAL DISPENSARY.—Resident Medical Officer, unmarried. Salary £300 per annum, with apartments, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BROMSGROVE, WORCESTERSHIRE ASYLUM.—Locum Tenens Medical Officer.

CAMBRIDGE, ADDENBROOKE'S HOSPITAL.—Resident House Surgeon. Salary £150 per annum, with board, &c.

CHELMSFORD, ADMINISTRATIVE COUNTY OF ESSEX.—Tuberculosis Officer. Salary £500 per annum, &c.

CHERTSEY COMBINED DISTRICTS (CHERTSEY URBAN AND RURAL, WALTON-ON-THAMES, WEYBRIDGE, AND WINDLESHAM URBAN DISTRICTS).—Female Temporary Medical Officer. Salary at rate of £400 per annum.

DARTFORD, KENT, CITY OF LONDON MENTAL HOSPITAL.—Temporary Assistant Medical Officer. Salary £7 7*s.* per week, with board, &c.

DUNDRUM, CO. DUBLIN, CENTRAL CRIMINAL LUNATIC ASYLUM.—Locum Tenens Assistant Medical Officer.

DURHAM COUNTY HOSPITAL.—House Surgeon. Salary and bonus at rate of £180 per annum, with board, &c.

GREAT NORTHERN CENTRAL HOSPITAL, Holloway, London, N.—House Physician and Two House Surgeons for six months. Salary at rate of £100 per annum, with board, &c.

HÔPITAL FRANÇAIS, 172, Shaftesbury-avenue, W.C.—Honorary Radiographer.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

IPSWICH, EAST SUFFOLK AND IPSWICH HOSPITAL.—Female Resident. Also Medical Officer to Department for Treatment of Venereal Diseases. Salary £4 4*s.* per week, &c.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle-street.—Female House Surgeon.

MANCHESTER COUNTY ASYLUM, Prestwich.—Locum Tenens. Salary £7 7*s.* per week, with board, &c.

NOTTINGHAM GENERAL HOSPITAL.—Female House Physician for six months. Salary at rate of £250 per annum, with board, &c.

PRESTON, COUNTY BOROUGH OF.—School Dentist. Salary £300 per annum.

QUEEN MARY'S HOSPITAL FOR THE EAST END.—House Surgeon.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Medical Officer in charge of Electrical Department. Salary £100 per annum.

ROCHESTER, ST. BARTHOLOMEW'S HOSPITAL.—Junior Resident House Surgeon. Salary at rate of £150 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—Two House Surgeons. Salary £120 per annum, with board, &c.

STAFFORDSHIRE EDUCATION COMMITTEE.—Female Assistant School Medical Inspectors. Salaries at rate of £400 per annum.

VENTNOR, ISLE OF WIGHT, ROYAL NATIONAL HOSPITAL FOR CONSUMPTION.—Assistant Medical Officer for three months. Salary at rate of £5 per week, with board, &c.

WOLVERHAMPTON AND MIDLAND COUNTIES EYE INFIRMARY.—House Surgeon. Salary £150 per annum, with board, &c.

THE Home Secretary gives notice of vacancies for Medical Referees under the Workmen's Compensation Act for County Court Circuit No. 9 (Whitchurch, Crewe and Nantwich, and Market Drayton) and No. 51 (Portsmouth, Ryde, and Bishops Walton). Applications should reach the Private Secretary, Home Office, not later than August 15th.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Omagh, in the county of Tyrone.

Births, Marriages, and Deaths.

BIRTHS.

BIRT.—On July 20th, the wife of Lieutenant G. C. Birt, R.A.M.C., of a son.

FISHER.—On July 18th, at Great Eccleston, Garstang, the wife of Surgeon B. G. Fisher, R.N., of a son.

MARSHALL.—On July 12th, in Belfast, the wife of Captain Robert Marshall, R.A.M.C., of a son.

PAUL.—On July 20th, at 12, Upper Northgate street, Chester, the wife of Arthur Blackwell Paul, M.B., B.C. Cantab., of a son.

YATES.—On July 14th, at a nursing home, Regent's Park, N.W., the wife of Lieutenant Arthur Yates, R.A.M.C., of a daughter.

MARRIAGES.

BEAUMONT—HAMILL.—On July 23rd, at Chiswick, George Ernest Beaumont, M.A., B.M. Oxon., M.R.C.P. Lond., to Norah Hamill, M.B., B.S. Lond.

BROWN—STONE.—On July 19th, Captain William Brown, R.A.M.C., to Dorothea Mary Stone, elder daughter of E. Stone, of Glastonbury.

CARLISLE—OGILVIE.—On July 25th, at All Saint's Church, Harrow Weald, Captain H. G. Carlisle, R.A.M.C., Heswall, Cheshire, to Elsie M. Ogilvie, daughter of Mr. and Mrs. W. M. Ogilvie, The Glade, Harrow Weald.

HORTON—MACDONALD.—On July 20th, at Upton-vale Church, Torquay, Captain R. L. Horton, F.R.C.S., R.A.M.C., to Elizabeth Mackay Macdonald, second daughter of Robert Macdonald, of Lybster, Caithness.

LIGHTWOOD—WOOD.—On July 23rd, at St. Michael and All Angels, Eastbourne, Edward Eric Lightwood, M.B., B.S., Temporary Captain, R.A.M.C., to Doris Charlotte, youngest daughter of the late W. Musgrave Wood, of Newton Grove, Leeds, and Mrs. Musgrave Wood, of 18, Grange-avenue, Leeds.

PENNANT—DAVIES.—On July 13th, at St. Clears, Carmarthen, by the Rev. R. Gimblett, Captain D. H. Pennant, D.S.O., R.A.M.C., to Nan, only child of the Rev. and Mrs. T. Davies, of St. Clears.

WISE—KING.—On July 21st, at St. James's, Spanish-place, W., Henry Wise (Fe ix Henri Weiss) of 81, Harley-street, W., to Elise, daughter of the late James King, Lisburn, co. Antrim.

DEATHS.

ORTON.—On July 23rd, at 22, The Broadway, Crouch End, N., Frederic Orton, M.D., J.P., aged 70 years.

STEELE.—On July 15th, at Florence, suddenly, James Peddie Steele, M.D., LL.D., aged 81 years.

THOMAS.—On July 19th, at Swaffham, Norfolk, Augustus William Thomas, M.R.C.S., L.R.C.P., and late Lieutenant-Colonel, Norfolk Regiment, aged 58 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

ARNOLD, EDWARD, London.
Midwifery. By Ten Teachers. Under the direction of Comyns Berkeley, M.A., M.D., F.R.C.P. 18*s.* net.
Malingering and Feigned Sickness. By Sir John Collie, M.D., J.P. Second edition, revised. 16*s.* net.

CHURCHILL, J. AND A., London.
Surgical Nursing and After-treatment: A Handbook for Nurses and Others. By H. C. Rutherford Darling, M.D., M.S. Lond. 8*s.* 6*d.* net.
An Epitome of Mental Disorders. By E. Fryer Ballard, M.B., B.S. Lond. 6*s.* net.

CONSTABLE AND CO., London.
Health and the State. By Wm. A. Brend, M.A. Camb., M.D. (State Med.), B.Sc. Lond. 10*s.* 6*d.* net.

LONGMANS, GREEN, AND CO., London, New York, Bombay, Calcutta, and Madras. Manchester: At the UNIVERSITY PRESS, 12, Limegrove, Oxford-road.
Shell Shock. By Professor G. Elliot Smith, M.D., F.R.S., and T. H. Pear, B.Sc. 2*s.* 6*d.* net.

MURRAY, JOHN, London.
Handbook of Physiology. By W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S. Thirteenth edition. 16*s.* net.

Notes, Short Comments, and Answers to Correspondents.

STUDENTS' NUMBER OF THE LANCET.

INFORMATION intended for the Students' Number of THE LANCET must be sent WITHOUT DELAY, addressed to the Sub-Editor, and marked on the envelope "Students' Number Only."

ASCLEPIOS WORSHIP.

A LATIN inscription has been discovered at the Roman city of Thuburbo Majus, in Tunis, whereat there were *Thermæ æstivales*, which is of considerable importance in connexion with the ancient cult of Æsculapius. The god doubtless had a temple there, where his priests practised the healing art in proximity to the curative waters. The interest of the inscription arises from the curious prohibitory ritual which sets it forth as follows: "Iussu Domini Æsculapi. L. Numisius, S. L. F. Vitalis podium de suo fecit quisque intra podium adscendere volet a muliere a suillâ a fabâ a tonsore a balineo commune custodiat triduo cancellos calciatus intrare nolito." This text belongs to the series of which instances are found in so many ancient Greek temples of regulations of purificatory nature. Certain actions, or states of health, or contacts with things and creatures considered to be impure, rendered a person unfit for entering the holy precincts. This is the first specimen of such ritual interdictions discovered in Roman Africa. The prohibitions specified here are similar to those recorded in other inscriptions of like nature. Certain restrictions of diet and purifications were imposed as the prelude to initiation into sacred mysteries, or to admission to a temple for the purpose of cure by sleeping in the sacred enclosure, or to obtaining the blessing of the god through offerings and sacrifices. The introduction of such observances into the worship of the deity of medicine in Africa may have arisen from his being there, as in Phœnicia, identified with the old Semitic god Eshmoun. Very much the same restrictions have, however, been found to have been observed in Hellenic Asklepiea, especially certain rules as to abstinence. Philostratus tells us that an Assyrian youth who came to consult Asklepios at Ægea was neglected by the god because he had not ceased to drink wine and partake of good cheer. Sexual continence was frequently insisted upon; also the avoiding of various foods, such as beans, fresh cheese, and the flesh of swine, which were consecrated to Æsculapius. The enactment concerning shaving the head was connected with the old idea that iron coming in contact with the skin communicated evil. The reference to ablutions is common to many rituals of remedial and religious character.

Other relics of Æsculapius worship have been found at Thuburbo Majus, such as a head of a statue of the deity and the inscribed pedestal of another statue upon which an inscription refers to a personage as being a priest of Æsculapius. As Numisius Vitalis erected the *podium* by command of Æsculapius, this order was doubtless, as with all the god's instructions, unless given verbally by a priest, communicated in a dream.

THE HYPNOTISM OF PHRASES.

Mr. Lloyd George referred during his speech at the Queen's Hall last week to the prevalence of catch phrases, especially in Germany, and the hypnotic influence of such phrases is singular. They stop all intelligent discussion and thought. Those who have read extracts and translations from German newspapers and books during the last few years will have noticed the frequent recurrence, applied to England, of the inscription on the wall at the feast of Belshazzar interpreted by Daniel, "Mene, Mene, Tekel Upharsin." In the margin of the Revised Version this is translated as "Numbered, numbered, weighed, and divisions." Daniel's further interpretation was Mene, God hath numbered thy kingdom, and brought it to an end. Tekel; thou art weighed in the balances and found wanting. Peres; thy kingdom is divided, and given to the Medes and Persians. The modern Bible Dictionary, published by the Cambridge University Press, states that possibly the words are names of weights, that is, "a mina, a mina, a shekel and a half." In the interpretation in the Bible "Peres" is found instead of "Upharsin." The "u" in "Upharsin" is simply "and." Parsin (which is written Pharsin when a vowel precedes) is the plural of "Peres." We have all heard that the wish is father to the thought, and the desire of Germany for our destruction is very burning. But if the thought is crystallised into a catch phrase, the catch phrase as a crystal seems to flash its refulgence in all directions and hypnotise not a few of those who are open to its susceptibility, and when one crystallised expression has become bedimmed another arises to take its place with different facets and another refulgence so that steady vision finds it difficult to see the truth across the public arena which is twinkling with hypnotic phrases.

THE DESTRUCTION OF SANITARY TOWELS AND SURGICAL DRESSINGS.

THE inconvenience occasioned to women employed in hotels, workshops, and other public institutions from the lack of provision for the disposal of soiled sanitary towels is great, while the expense to the proprietors of such establishments from stopped drains, in consequence of the disposal of these articles in lavatories, is equally troublesome. To avoid these difficulties Dr. Arthur Mechan has devised a system which has been in use for over a year, and has received the approval of the Factory Department at Whitehall, where an apparatus has been installed for demonstration purposes to women welfare supervisors. A cardboard receptacle in a metal container is placed in lavatories about five feet from the floor, and the cardboard box when full is burnt in a special destructor, consisting of a cast-iron box placed on a pedestal or brackets. The system is claimed to be equally applicable to the destruction of surgical dressings. It is suggested that the physical and mental comfort afforded to women workers will lead to greater efficiency of work. Particulars and prices may be obtained from Mr. A. M. Morrison, 67, West Nile-street, Glasgow.

L.C.—German authors distinguish two local reactions at the site of a tuberculin injection: (1) a *Stich*-reaktion, or needle-track reaction, due to the minute dose of tuberculin deposited in the thickness of the skin itself, as the needle is advanced and withdrawn; and (2) a *Depôt*-reaktion, or nodule in the subcutaneous tissues where the injection is deposited. The latter is the usual local tuberculin reaction which may be used as a guide to dosage; the former is shown by a vivid red spot at the site of the puncture and an occasional painful nodule in the skin itself and is of no practical importance.

Medical Diary for the ensuing Week.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman. Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

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IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

MANAGER'S NOTICES.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1917 will be ready shortly. Bound in cloth, gilt lettered, price 21*s.*, carriage extra.

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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 25th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
July 19	...	120	78	62	61	66	Cloudy
,, 20	...	121	79	58	60	64	Fine
,, 21	...	107	70	62	63	67	Fine
,, 22	...	119	82	59	57	64	Fine
,, 23	...	120	82	60	60	71	Fine
,, 24	...	124	81	65	60	72	Cloudy
,, 25	...	122	79	64	62	67	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

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